NON EDIBLE OILS & SOAPS

1. non edible oils
2. Oil seeds
3. oil cakes
4. oil industries
5. Soap production

ALL INDIA
NON-EDIBLE OIL INDUSTRY
ASSOCIATION, POONA

Souvenir

The Third All India Conference
and
Second All India Seminar

of the

Non-Edible Oils & Soap Industry

Khadi & Village Industries Commission, Bombay

HELD ON
8TH, 9TH & 10TH JUNE 1958
AT POONA

Edited by
Kum. K. D. Hervatte

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Foreword

In February 1956 for the first time the idea of forming a sort of Federation of the Non-Edible Oil and Soap Centres under the Khadi and Village Industries Commission was conceived. At the All India Conference at Bolarum in March 1957, this body was formed under the name of the All India Non-Edible Oil Industry Association. The first two conferences were convened directly by the Khadi and Village Industries Commission. It is indeed a matter for pride for this Association to have been able to convene the third Conference at Poona under its own auspices, which is certainly an indication of the fact that this Industry is taking roots on surer grounds and this organisation serves a highly useful purpose.

From the deliberations of the Poona Conference, one could easily discern a refreshing approach with which the problems of the Industry were scanned and discussed, the readiness on the part of our workers to adopt improved techniques in methods of organisation of production and marketing and lay due emphasis on the aspects of quality and economy of production.

Obviously, a review of the past two years has revealed that from the seemingly superfluous ideals of giving increased employment in village through the collection of non-edible oilseeds in the season and processing them, this naturally releases a larger quantity of edible oils for human consumption. Our workers are, therefore, contributing in an ever increasing degree to producing more and more non-edible oils and thus increasing its status in the industrial field.

The Non-Edible Oil and Soap Industry, which was introduced by the All India Khadi and Village Industries Board in 1953-54 as an experimental measure, has, at present, a network of over 500 units which act as pioneers carrying the messages of the Industry far wide and propagating the need to conserve, preserve and utilize non-edible oilseeds to an ever increasing degree. I am sure that no one can deny due credit for this to the sponsors of the Industry, whosoever they may be. It was they in fact who visualised

its importance. The attention which this hitherto uncared for wealth of vegetable kingdom is receiving at the hands of these scientists, technologists. industrialists and workers is an indication of the foresight of the initial sponsors and the All India Khadi and Village Industries Board who undertook to launch the programme under their auspices.

At this juncture I am glad to recall the contents of a speech delivered by the Organiser of this Industry, Shri Shrikanta Rao, at the Amravati Conference in February 1956, wherein he had categorically stated that the day would not be far off when everyone in the country would think of switching over to the utilisation of non-edible oil-seeds for producing various oils and use them for different industrial purposes. Even at that time he had stated that the Khadi Board was conscious of the need to adopt improved techniques to bring out quality products and pleaded for creating conditions so that the advantages of advanced scientific and technical knowledge could be made to serve the village industry units suitably. Although, we are still at the threshold, there is every justification to congratulate the members and workers of the Khadi and Village Industries Commission for their zeal and ability in coming forward to tackle the problem on right lines.

The main difficulties experienced since the time of the first conference in February 1956, "for procurement of raw materials, marketing and disposal of the finished products, adequate trained personnel, etc.", had been met to some extent by the time the Second All India Conference was held at Bolarum in March 1957. The objectives are now becoming more and more defined and collection of non-edible oilseeds is becoming more systematized, integrated and properly planned. Similarly, noticeable improvement in training standards, quality of products, standardization, etc., is coming about.

Besides this, the scope of the Industry has been definitely extended. It was quite manifest from the deliberations during the above-mentioned conference that the pioneers' dream of exploring many other oilseeds and manufacturing many other products and by-products from non-edible oil besides soap, has started taking shape. Since oils, whether edible or non-edible, owe their importance for their constituent properties, the scope for the development of the latter is by no means less than for the former i.e., the edible oils.

The Karve Committee's Report on the 'Village and Small Scale Industries' gave this industry only a secondary place as compared with production of oil through village ghanis and pounding of rice etc., and consequently it figured merely in the miscellaneous group in the Second Five

Year Plan. This was so because there were certain doubts in the minds of the planners about the feasibility and practicability of this programme. I feel confident, however, that the progress made during the past few years would be taken into due consideration and it may be regarded as having qualified itself for being incorporated in the Third Five Year Plan as an important major village industry. By the time the Third Five Year Plan begins to operate, I have every hope that this industry will take up new projects like refinement of oils on a village scale and a few other projects of similar nature. I would like, therefore, to plead for a proper appreciation and co-ordination of the programme at all levels in the country as a whole. I would also appeal for co-operation from those engaged in scientific work connected with oils whether connected with forestry or agricultural research. This is a matter of very great importance for the progress of this industry on a national scale. I feel sure that the contents of this Souvenir which is being issued to mark the occasion of the Third Annual Conference and Second Seminar of the Industry, will help to convince all concerned of the correct stand taken by the Industry and its importance in the country at large.

P. S. DESHMUKH,
Minister for Agriculture,
Government of India.

Contents

Third All India Conference
Non-edible Oils and Soap Industry

held on 8th and 10th June 1958 at Poona

INAUGURAL FUNCTION

The main item of the programme namely, the inauguration was scheduled to be performed by Shri. Sri Prakasa, Governor of Bombay on 8th June 1958, who unfortunately could not be present on the occasion as he had to leave Poona on the same day. However, this disappointment was immediately compensated by the right choice of Dr. N. N. Godbole, retired Director of Industries, Rajasthan and an eminent and experienced scientist in the field of oil and soap technology, for inaugurating the Conference. The function began at 5-30 p.m. Dr. P. S. Deshmukh, President of the Association joined the gathering at 6-30 p.m. due to his train connection having been missed at Kalyan.

Shri. P. V. Shrikanta Rao, Chairman of the All India N-E-Oil Industry Association welcomed the delegates and gave a review (please see P P. 3-8) of the progress made by the Industry since the time of the last Conference. Later on, he requested Dr. N. N. Godbole to inaugurate the function.

The extempore speech of the distinguished guest of the evening, Dr. N. N. Godbole, was listened to with keen interest and rapt attention by the delegates and invitees to this function. Narrating the development of Soap Technology in India since 1920, Dr. Godbole pointed out that the technical illiteracy in India was the main cause of hindrance in her industrial progress. Referring to the present insufficient production of edible oils in the country and difficulties in procuring the required imports, he stated that the attempts of the Industry to collect non-edible oil-seeds was really laudable. (For Speech see P P. 9-11).

Dr. P. S. Deshmukh, President of the Association arrived at the time when messages received on the occasion from distinguished persons were

being read by Shri Shende Hon. Secretary of the Association. (For messages See P. 12). Shri. Shrikanta Rao, Chairman, welcomed the President, Dr. P. S. Deshmukh and requested him to deliver the Presidential Address. Referring to the industries run with State aid, the President averred, "It is very necessary that village industries which receive sufficient aids from the Government should be tested on the touch-stone of economics."..... "No cause, however, noble or beneficial for the people could be carried on for an indefinite period with State aid, unless it is economically sound too. This would aptly apply to the Non-Edible Oil and Soap Industry like other village crafts....." Dr. Deshmukh confidently said that there was no reason why this industry could not be developed economically sound, if concentrated large scale efforts were made on more scientific lines.

(For report of the President's Speech see P.P. 13-14).

With the conclusion of the Presidential Address the exhibition specially arranged on the occasion was inaugurated by Dr. P. S. Deshmukh. The exhibits painstakingly collected, by the Organisers of the Exhibition from all parts of India, especially the non-edible oil-seed bearing plants, their seeds, oils and soaps attracted the attention of the delegates as well as the citizens of Poona. This was one of the best exhibitions so far arranged by the Industry. Several murals, posters as well as models of equipments were displayed. The visitors were promptly explained by the assistants at the stalls. Thanks are really due to Dr. K. K. Dole and his team of workers who devoted much of their valuable time to make the exhibition a success.

Besides the above features of the Conference, meeting of the Board of Management of the Association and that of the Quality Control Committee of the Industry, appointed by the Khadi & Village Industries Commission were also held on the first day of the Conference. Earlier in the morning, the delegates had an informal preliminary meeting, report of which is given elsewhere in this souvenir.

A Review of the Non-Edible Oils and Soap Industry For The Year 1957-58.

by

Shri. P. V. Shrikanta Rao,
Organiser, Non-Edible Oils and Soap Industry
Khadi and Village Industries Commission.

It is my great privilege to have this opportunity to extend to every one of you a hearty welcome on behalf of the Khadi & Village Industries Commission, All India Non-Edible Oils Industry Association and myself, to this function. Unlike the first two Conferences which were held at Amravati and Bolarum and directly convened by the then All India Khadi & Village Industries Board, this Conference has been convened under the auspices of the All India Non-Edible Oil Industry Association, a federation of the Non-Edible Oil and Soap production centres, under the patronage and guidance of the Khadi and V. I. Commission. It is by no means an ordinary achievement on the part of our production centres to have resolved to constitute themselves into a federation, even at the time of the first Conference and I am no less happy to see you all assembled here to-day under its auspices. Your Association is singularly fortunate to have the Union Minister for Co-operation, Dr. Punjabrao Deshmukh, at the helm of its affairs as its President and we all feel rarely privileged for his consenting to guide the Association. He is one of those few constructive workers and educationists who have devoted their lives to the cause of ameliorating the conditions of poverty-stricken people. The Shivaji Education Society with its manifold activities and numerous institutions stands not only as a tesimony but would continue to be a monument of his life work. It is also our good fortune to have been able to persuade an able and ardent constructive worker, Shri. S. G. Shende, to take upon himself the onerous respon-

sibilities as its Secretary. I am sure and feel confident too that the great aspirations with which the Association has been formed would meet their fulfilment under the stewardship of such friends of this great movement.

2. Every year the number in the family of our Industry is increasing and with the increase in the strength of centres, it is quite natural that numerous and diverse problems would be facing the Industry in course of time. The total number of centres to whom financial assistance had been given till 31st March 1957 is 295, 5 in 1953-54, 24 in 1954-55, 105 in 1955-56 and 161 in 1956-57. During 1957-58 funds have been disbursed for setting up 213 centres. The total expenditure incurred in the different years are as follows :—

	1953-54	1954-55	1955-56	1956-1957	1957-58
Grant	97,000/–	3,47,150/–	10,27,200/–	12,69,250/–	17,82,250/–
Loan	1,65,000/–	6,15,500/–	21,62,000/–	22,49,250/–	28,93,250/–

3. During the years 1956-57 and 1957-58, Statutory State Boards have come into being in almost all the States. Therefore, the policy of the Commission has been to release funds to the State Boards for further transmission to the Institutions and Co-operatives in their area. A number of State Boards being new, naturally their disbursements take longer period as a result of which a large number of centres are unable to take to the production programme according to schedule. But it is hoped that such a state of affairs will not last long. For the above reason out of 295 centres sanctioned upto 31st March 1957, and expected to go into production during 1957-58, only 161 centres went into production. The total production of soap during the year 1957-58 is 25,91,000 lbs., as against 12,53,000 lbs. produced by 78 centres during 1956-57. It may be interesting to note that the average cost of production during 1955-56, 1956-57 and 1957-58 was 57, 51 and 56 nP. per lb. and the average selling price 65, 57, and 64 nP. respectively. The point that the variation, in the month to month cost of production, during 1957-58 ranging between 51 and 58 nP. per lb. of our soap, has been rather small, bears testimony to the fact that the working conditions of the production centres have improved considerably. In the year 1955-56, month to month cost of production varied between 43 and 70 nP., and during 1956-57 between 39 and 59 nP.

4. There has been a remarkable increase in the employment aspect also, from 422 in 1956-57 to 630 in 1957-58. More than 20,000 people were en-

gaged in seed collection work in the last season from 1 to 2 months. Although the percentage achievement of our targets is below the mark for reasons of administrative difficulties as mentioned elsewhere, still the steady progress, that is in evidence, judged in the light of the above observations is a positively encouraging achievement.

5. An important aspect of the development programme includes working out correct estimates of availability potentialities of non-edible oil seeds, proper and timely collection of the seeds in the season, local storage facilities in the area of availability, pre-treatment of the seeds till the time of their crushing, i.e. depulping, drying, decorticating, etc. With the object of guiding the production centres on all these points a number of surveys had been conducted during the year. As a result of these surveys, new pockets hitherto unexplored have come to light. Areas growing Khakhan (Pilu seeds) have been discovered in parts of Rajasthan, Gujerath and the Punjab. Khakhan oil can suitably replace the coconut oil in soap making thereby causing to release the coconut oil for edible purposes, besides giving employment to large numbers. Even today a lot of coconut and its oil are imported from outside into this country and it should, therefore, be possible to reduce the imports gradually if it could be replaced by such substitutes. Another important substitute for coconut oil is Pisa fat whose plants have been known to grow in certain districts of the Western Ghats. In the last season collection of these seeds was attempted as an experimental measure at Ghatghar in Nagar District with the object of studying the methods and economics for its exploitation in soap making as a substitute for coconut oil. The importance and necessity of exploring fully a non-edible oil substitute of coconut oil for soap makers is too well known to need any emphasis.

6. Field research, better known as operational research, has also been planned during the current year departmentally after studying a large number of cases of the last few years. It is hoped that it would be possible to lay down specifically certain standardised operational methods and extend such technological knowledge as could be practicable to be made use of at the village level. The prime responsibility of every one of us engaged in this programme and also of all those who are authorities on scientific and technological matters relating to this Industry is to find out ways and means as to how best this knowledge and experience could be made applicable at the village level. This is more true in case of our non-edible oilseeds because many of them have to be collected, during the season within a short

time. In other words, the point of paramount importance is to see that the collection programme is so timed as to suit the whims of nature and geared up with all alertness. Should the rains set in, the opportunity would be lost, and that would mean idle time for the whole year to large numbers.

7. The next aspect of the programme is the supply of trained personnel for its execution. Eight Training Centres had been set up all over India for the purpose. In all 367 persons had been trained last year which include 25 graduate chemists, 6 teachers and the rest artisans. From the experience in the field it was found necessary to conduct refreshers' course for the already trained personnel and provision has been made for it in the current year. The course of a graduate chemist has now been extended from three to six months including one month's practical work in an already-working production centre. The artisan's course is, as before, of three months' duration. The syllabus has been revised in the light of the experiences gained so far and also in the light of the new approach in our methods of work, i.e. production of quality goods and making them available, as far as possible, at competitive prices.

8. Another important feature of the year 1957-58 is the appointment of the Quality Control Advisory Committee for the Industry by the Commission under the Chairmanship of Dr. J. G. Kane of the Department of Chemical Technology, Bombay University. Dr. Kane, as you all know, is an authority on the subject and very luckily for us, he is one of those few celebrities who have their inclination towards making use of their knowledge and experience at the village level. The other members of the Committee are Dr. M. S. Rao, Dy. Director, Village Industries Research Institute, Wardha, Dr. R. P. Sabnis of the Bombay Village Industries Board, Dharwar, Dr. C. R. Mitra of the National Chemical Laboratory, Poona, Shri. B. M. Desai of the Bombay Suburban District Village Industries Association, Borivli and Shri. B. G. Pendharkar, former Manager, Swastik Oil Mills, as its Secretary. This Committee has given a very effective lead towards ensuring production of quality products by our centres. As a first step, on the advice of the Committee, each member of our technical staff is being provided with a testing kit to enable him to guide the centres in the production of quality goods. A scheme for starting a number of Regional Laboratories to facilitate the testing of soap regionally has been approved by the Commission. A proposal for setting up of a Central Laboratory attached to the All India Non-edible Oil Industry Association in Poona, is also under examination.

9. The last but not the least important problem that has been actively engaging the attention of the Commission is that of marketing of products. Unless market is assured, the production programme is bound to suffer and the production centres would be forced to incur losses and close down. With the steps now being taken to ensure quality production it is also necessary that our centres are economically working units capable of repaying the loans given to them. It is all the more necessary that such conditions be created as would reduce gradually the quantum of subsidies. The Industry earlier could be set to work with least subsidies, the stronger would be the justification for its continuation as a national programme because no Government can afford to subsidise indefinitely such national programmes. With this object it is proposed to conduct economic investigations of the working of our centres so that the uneconomically working units could be guided, right from seed collection to the marketing of soap.

10. As has been stated elsewhere, there are a few centres which have not been able to make any progress for some reason or the other. Steps to reorganise such centres and assist them to consolidate their work are being taken. In other words the year 1958-59 is a year of consolidation and with the help of field evaluations made in the last year every effort is being made towards setting the Industry on a sound footing.

11. The choice of the consumer is another notable issue which confronts the sellers. The choice is influenced, in the first instance, by the price, if not entirely, at least to some extent. Unfortunately, for a commodity like washing soap, quality considerations are rare. This problem is presented particularly because in the market a lot of filled and adulterated cheap soaps are available. Naturally our centres have to face this hard fact. As a solution to this problem of marketing, conducting adequate propaganda with the object of educating the people to demand purer stuff for the money spent by them is an urgent necessity.

12. There can be nothing more desirable than to understand the significance of the saying "example is better than precept" by everyone of us wedded to this cause.

13. In conclusion, I would like to submit that the responsibility of the village industry worker is no less heavy than any of those in the large scale sector. Rather it is much more so because of the fact that in comparison to the advantages of improved technology and mechanised equipment owned by the large scale centralized sector, our industries have to depend more

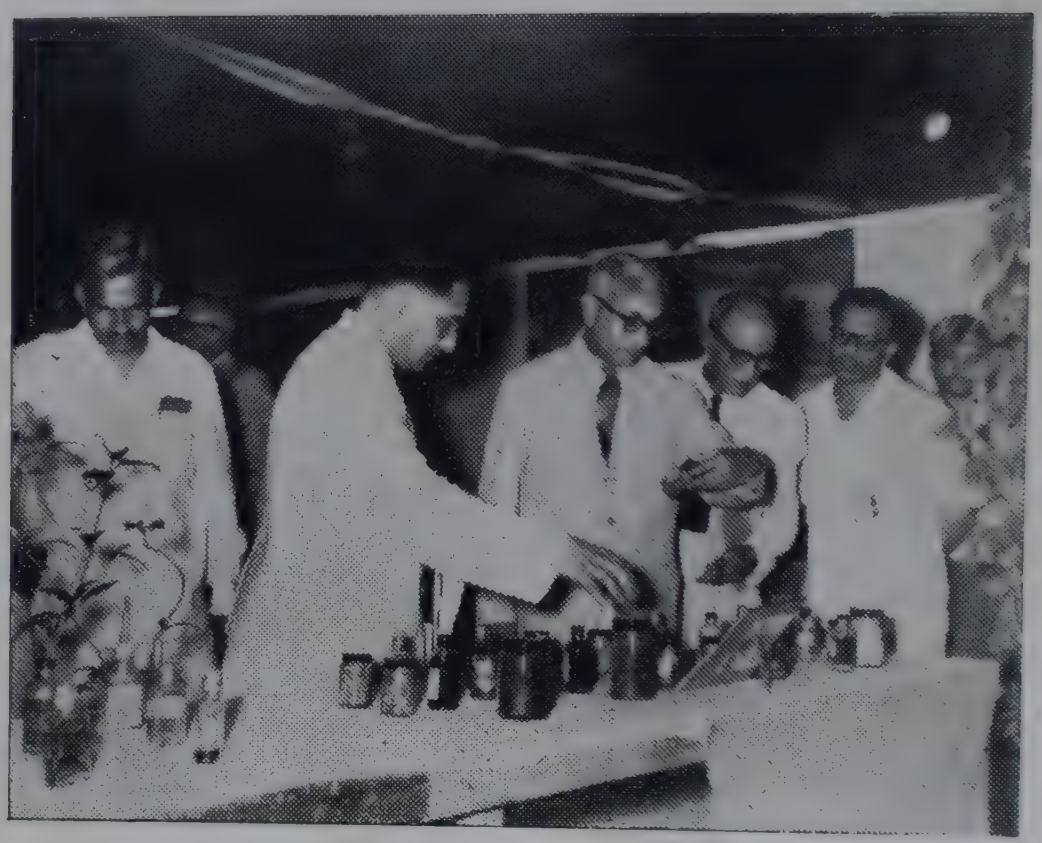
upon the assiduity and resourcefulness of our workers in our methods of work so as to eliminate wastage both of time and raw materials and increase efficiency in output, constantly keeping a vigilant eye and an open mind to make use of the available technological knowledge to the fullest at the village level, and also bearing in mind the fundamental aims of any planned village industry.

14. While doing so, a maximum use of indigenous talents would be set at work which, in turn, is apt to create a proper atmosphere and provide opportunities for a healthy development of local initiative in the village life. These essentially involve an arduous responsibility upon everyone of us to establish closer contacts and vital links with the rural folks without which it would be futile and unwise also to think in terms of implementing successfully such a programme. Let us also not suffer from any complex to think that there is not much technology needed in the village industries and that is what many of the able men of our country think. The ability of a highly developed and modernised technology should be a guarantee for its adaptation at the level of the average man and his village.

15. Therefore, at this hour, the supreme duty of everyone in the country, be he a village worker, a commercial man, a technologist, an administrator or a politician, is to think seriously how best he can contribute towards evolving a rationalisation in the working of the village industries. In a country like ours, the urgency and expediency which this problem demands, need no emphasis.

Dr. Punjab Rao Deshmukh
delivering the presidential speech

A View of the audience



Glimpses of the Exhibition

Inaugural Address

BY

Dr. N. N. Godbole

Friends,

I know you were impatient to hear the Governor of Bombay and also the Minister for Co-operation of The Union Government. Their absence might have given to you a set back. But those engaged in a cause like this should not feel that way for a long time or else such a mood will impede their work. I am very happy to welcome all of you who are from all parts of the country. I do not want to take a long time. We have come here to do some serious business. We must express our thoughts clearly. I am grateful to you for asking me to inaugurate this function. I take it a privilege, not merely because I am interested in soap itself, but because I would not be wrong in saying that I am associated with soap since the year 1920 in the Benaras University where under the inspiration of the late Pandit Madan Mohan Malaviya, we began the course of soap technology. Panditji used to defend national education, which the then British Government did not carry out. I happened to be his first choice for this purpose. I am very happy that I got this opportunity and started the course in the year 1920-21--a course, which no other University had started till then.

In India, the consumption of soap is very low. I do not want to bother you with statistics. We are perhaps the lowest in the annual consumption. If you take the soap industry in India, the organised sector produces about a lac tons. Consumption depends upon climatic conditions also. The first problem is how to make people more and more inclined towards soap. We in India are rich in oil seeds, edible and non-edible. When I went to Rajasthan, there I found certain non-edible oil-seeds. Our attempts are to make use of non-edible oils for soap so that edible oils can be saved for the purpose. We can also use the tallow obtained from dead animals which is going waste in villages, for preparing soaps. There are some

Hindus who do not like tallow soap, also some Mohamedans who will not use foreign soap as it contains lard from Pigs.

After all a soap is a mixture of tallow and coconut oil or groundnut oil or other oils. Pandit Malaviaji did not like soap with tallow. He was always asking whether the soap contained tallow. Once one gentleman brought Mysore Sandal Wood Soap before Panditji. Panditji called me and asked me as to how the soap was made. I told him that it contained tallow. "How the Maharaja (of Mysore) is allowing this?", he posed a question. I replied, "Maharaja is not in charge of it". Even today, we do have people who do not like tallow.

Several foreign advertisers announce that a prize will be given if the soap is proved to contain any injurious material. I know many of the foreign soaps are free from animal fat. We have to go forward. In the new race, we cannot go backwards. In the case of soap industry, nearly 65% of the industry was foreign owned. Some of these foreign organizations have established agencies for marketing e.g. Brooke Bond and Lipton Tea. We, in India, stock foreign goods. I asked one of the shopkeepers and he told me that our canvassers do not go to them. We got our political independence but we have not got our industrial independence. We should not lose industrial independence. But what is happening now? We are not knowing how to use India's products—Indian Brands. We are 40 crores of people and producing 2 lac tons of soap only. I would tell these Gramodyog organizations to use Gramodyog goods according to Gandhian ideal. There is one word. We in India are illiterate I may say 75%. I would tell you how. Many of you do not understand what is a metalled road. That is, we have got technical illiteracy. I am a scientist. On seeing the soap, I will ask how much of free Alkali, how much of soap and how much of water (it contains). According to proper scientific conditions, it should be free from alkali. One of my colleagues told me that he was using Amritsar soap. He used to buy the soap which contained 50% alkali. If you rub more and more, dirt comes out. He was telling me, it is cutting dirt. I told him it is not cutting your maila (dirt) but already 'Mitti' is added to it and that is coming out.

I know we are going to increase production of caustic soda. About two years ago we were getting our essential oils from abroad. We are sending raw materials, at Rs. 35/- per lb. in the shape of finished products as oils. We have got monopoly of certain oils, such as sandal wood oil. I was trying to find out once as to under which head the same are booked, in order

to assess as to what quantity of the same is exported. I found that under the heading "Timber" the same were booked. There is difference between a villager and our national planner. We have to make the villagers technically literate. All that I would like in our products is a certain minimum standard of efficiency. We have got different approaches and we have to compromise between large scale and small scale.

Glycerine, though a valuable by-product is kept out while preparing soap. In Calcutta it was thrown out. In Berlin they collected this from round about places and started a Glycerine Factory. We likewise waste some of our products. In the case of Soap Industry, every day two tons of Glycerine is going into sea every day. We know, in Germany, there is a rational way that nothing is wasted. Remember, our workers should make up their mind that everything is used. I have no doubt that this Conference is going to achieve this.

I wish that every one of you comes to tell me what can be done on a small scale. In this line of soap you have got a new class of soap which is known as Sulphonite Soap. A few of our big concerns are now able to make Glycerine in India. We are not able to suffice our home demands in respect of this. Another important point is that imports are cut off.

Messages

A large number of messages were received wishing the Conference and Seminar success. Amongst those from whom messages were received, the following may be prominently mentioned.

Shri. Govind Vallabh Pant, Home Minister, Government of India; Governors of Madras, Madhya Pradesh and Rajasthan; Shri. V. L. Mehta, Chairman, Khadi and Village Industries Commission; Chief Ministers of Bombay, Uttar Pradesh, Mysore and Rajasthan; Shri. Haribhau Upadhyaya, Chairman, Rajasthan Khadi and Village Industries Board and Shri. K. T. Satarawala, I.A.S.

Shri. Y. B. Chavan, Chief Minister, Bombay State, observed as under:

"As a Village Industry, the Non-Edible Oil and Soap Industry has great scope for employment and production. There are many vegetable oils in India the full potentiality of which has not yet been fully explored. Better and more efficient methods for extraction of oils and preparation of their products are also needed. I am, therefore, glad to note that the All India Non-Edible Oil Industry Association is engaged in the task of conducting a survey of the resources of the availability of Non-Edible Oil seeds all over the country so that it might be possible to assess the potentialities of utilising these oil seeds for industrial and medicinal purposes and draw a comprehensive and consolidated all round programme for the development of Non-Edible Oil Industry in all its aspects as a Village Industry. I feel that the Conference will be of great benefit if it succeeds in focusing attention on these problems and indicates the general lines on which the industry should be developed. I wish the Conference every success."

Message from Shri Vaikunthalal Mehta, Chairman, Khadi and Village Industries Commission.

"You have all my good wishes for the Conference as also for the Seminar.

I am sure both will be helpful in the development of this Industry which represents the production of wealth from waste."

Report of
The Presidential Speech

Dr. Punjab Rao Deshmukh, Union Minister for Co-operation while delivering his speech at the Inaugural Function, appealed to the delegates to bring the Industry on sound lines. He said that if any industry has to survive, it is necessary that it should not only supply quality goods to the consumers but also be economically sound and self-sufficient. It is, therefore, very necessary that the village industries which receive sufficient aids from the Government should be tested on the touchstone of economics for they should not expect to be subsidised for a long time. It is about time now that those running village industries should try to put them on sound economic footing besides evolving better methods of production." Elaborating this point further, Dr. Deshmukh said, "No cause however noble or beneficial for the people could be carried on for an indefinite period with the aid of the State, unless it is economically sound too. This would aptly apply to the non-edible oil and soap industry like other village crafts in which the production costs are higher than in the organised sector."

Eulogizing the efforts made in the direction of reserving the edible oils for human consumption by utilising the non-edible oils in the manufacture of soap, the Union Minister added "the percentage of intake of oils and fats in India stands deplorably low today. This is harmful from the point of view of national wealth. It is, therefore, very appropriate that the production of soap from non-edible oils could spare huge quantities of edible oils for the people. It is sinful to use edible oils for industrial purposes when the average per capita consumption of oils and fats has not come up even to one ounce."

Enumerating the odds facing this industry, Dr. Deshmukh continued, "Collection and transport were the biggest problems facing the industry as there were no concentrated plantations of the trees bearing non-edible oil

seeds. They often grow in jungles and far off places. But these odds should not deter us from our resolve to make this industry a success. There are vast sources of non-edible oil seeds which have not yet been tapped. If concentrated efforts are made on a large scale to organise this industry, on more scientific lines, there is no reason why we cannot make this industry economically sound, so that it can compete with the large scale soap industry. There are two main difficulties in collecting the seeds. Neem seeds can be collected only when they are ripe, just before the monsoon and even during the monsoon and, therefore, they are mixed with mud and water. The second difficulty, is that they are scattered throughout vast areas, all over the country. Transport cost in addition to collection cost increases the cost of production. You have to bring the seeds to a certain centre. If it is for five miles, it will not be costing more, but sometimes it has to be carried 10 to 20 miles.

"It was found that tobacco seeds which contain a certain amount of oil are wasted in Andhra. They have no idea that this seed contains oil. To extract oil from tobacco seeds is rather a difficult process.

"I could not attend the Second Conference at Bolarum. But at the First Conference held at Amaravati where I was present, I agreed to be the President of this Association. I shall be happy if somebody else takes my place now. I hope this Conference will be successful and as a result of the Conference held in Poona we will go a few steps further."

Proceedings of the Informal Meeting
Of The Delegates on 8th June 1958

The informal preliminary meeting of the delegates and invitees was held at 8-00 a.m. on 8th June 1958, presided over by Shri. Shrikanta Rao, Chairman of the All India Ne-Oil Industry Association and the Organiser of the Industry. The meeting was attended by over 100 representatives from production centres, besides other distinguished guests. (List of invitees and delegates given at the end). The officers and field staff of the Non-Edible Oil Industry Section of the Khadi & Village Industries Commission also participated in the meeting.

At the outset, Shri. S. G. Shende, Secretary of the All India Non-edible oil Industry Association welcomed the gathering and requested the delegates to introduce themselves.

Shri. Shende's Speech :—

In his speech Shri. S. G. Shende impressed upon the gathering the necessity of full exploitation of the entire non-edible oil-seeds available in India by arranging their proper collection, crushing, refining etc., on the village industry scale. This, he said requires a phased planning by those engaged in the Industry. Shri. Shende urged the delegates to bring about greater co-operation in between the Association and their centres, as well as between this Industry and other village industries. Referring to the present state of the Industry, he compared it to the woollen industry which experienced difficulties in procuring raw materials, rather than in marketing the finished products. Further, he said that if proper steps were taken in obtaining raw materials, training technical personnel and maintaining quality of products, the problems of marketing would be solved automatically.

Later, Shri. P. V. Shrikanta Rao addressed the delegates (for full text of his speech, see Appendix I). In his speech, Shri. Rao touched all important aspects of the Industry, like repayment of loans, maintenance of accounts, training, forest contracts, disposal of oil cakes and soaps etc.

Thanking the organisers of the Conference for inviting him on the occasion, Shri. Bihari Prasad who addressed the meeting after Shri Rao informed the delegates that the work undertaken by the Khadi & Village Industries Commission was really commendable and that these industries, like the Soap Industry, provide employment to a great number of people. Referring to collection of oil-seeds he stated that in the State of Bihar, Karanja seed in Chhota Nagpur and, Neem & Mohwa seeds in Santhal area are available in plenty. People are ready to collect them, but the problem is that of preparing good soap out of them. Shri. Brija Bihari emphasised the significance of this industry which aims at increasing employment opportunities at the same time releasing edible oils for human consumption. He concluded his speech by urging the delegates to take to manufacturing of standard soaps so that the Industry could prosper.

Shri G. K. Gaekwad from Dalit Sewa Samaj, Aurangabad narrated some of the difficulties experienced by his centre. He complained that the trained persons employed did not work satisfactorily, and that the ghanis installed by the centre could not be operated due to some inherent defects which could not be got locally removed in the absence of any good mistry. "As regards seed collection," Shri. Gaekwad continued, "We had to meet with considerable obstacles in obtaining contracts from the Bombay Government. Now that there would be no difficulty after the contracts are affirmed; we would like to exchange on barter basis, Mohwa oil which is abundant in our area with Khakhan oil." He also stated, that probably the inefficiency of the chemists employed might be due to the short duration of training period which was insufficient to turn out good personnel. The salaries paid to them may not be enough to meet their expenses. Thus Shri Gaekwad expressed, "they do not stick to the job, when they could get better emoluments elsewhere. So far as propaganda is concerned, if an individual centre is not in a position to undertake it independently, a group of centres in the locality should arrange for it jointly. Moreover, products are sold through Gramodyoga Bhandars where only Khadi buyers go. Thus to publicise our products some other device should be used".

Shri P. V. Shrikanta Rao explained how such problems experienced by the Centres could be solved. He said that whether an employee works sincerely or not depends on the treatment he gets from the management. As regards the present mode of crushing, Shri. Rao opined, it is a matter for the Conference to review what should be the policy in this regard and that the Commission could only then consider the matter. "Since the

training syllabus has been improved and the training period increased from 3 to 6 months", Shri. Rao said, "There may not be any more complaints about the efficiency of trained personnel." As regards repayment of loan the Organiser added that it should not be postponed since the centres could ask for fresh loans simultaneously with the repayment. He reiterated that repayment of loans should be as per terms and conditions to earn a certificate of credit-worthiness for obtaining further loans.

At the end, Dr. N. N. Godbole also addressed the meeting at the request of Shri. Rao.

The following sub-committees were then formed to deal with the various issues raised in the course of the morning deliberations.

I. Work of production Centres—financial implications.
II. Seed collection—its problems.
III. Research, equipment and quality control.
IV. Disposal of Ne-oil cakes.
V. Problems of different Centres.
VI. Marketing.
VII. Co-ordination of Village Industries.

The sub-committees were directed to submit their reports to the Chairman, Shri. Rao, on the following day so that suitable resolutions could be drawn up for consideration in the plenary session on the 10th June, 1958.

Copies of the programme of the Conference and the Souvenir were then distributed to those present. (For copy of the programme vide p. 18-19). The sub-Committees met during the course of the day and the reports of the sub-committees were passed on to another sub-committee consisting of Shri. P. V. Shrikanta Rao, Shri. P. V. Gujerathi and Shri. R. V. Patankar for culling out salient points in the form of resolutions.

Programme

Second Seminar and Third Annual Conference of the Non-Edible Oils and Soap Industry at Poona on the 8th, 9th and 10th June, 1958.

SATURDAY the 7th June, 1958:

All delegates and invitees to arrive by

19-00 hrs.	..	
19-15 hrs.	..	Prayer.
19-30 hrs.	..	Meals.

SUNDAY, the 8th June, 1958:

8-00 hrs. — 9-00 hrs.	..	Introduction and preliminaries.
9-00 hrs. — 11-00 hrs.	..	Subjects Committee Meeting.
12-00 hrs.	..	Lunch.
14-00 hrs. — 15-30 hrs.	..	Subjects Committee Meeting.
15-30 hrs. — 16-30 hrs.	..	Quality Control Committee Meeting.
16-30 hrs. — 17-15 hrs.	..	Break for Tea.
17-15 hrs.	..	Delegates to be in their seats for the Inaugural Function.
17-25 hrs.	..	Arrival of the Chief Guest.
17-30 hrs. — 20-00 hrs.	..	Inaugural Function and opening of the Exhibition.
20-00 hrs. — 20-30 hrs	..	Meals etc.
20-30 hrs. — 22-30 hrs.	..	Meeting of the Board of Management of the All-India Non-Edible Oil Industry Association.

MONDAY the 9th June, 1958:

8-00 hrs. — 9-00 hrs.	..	Inauguration of the Seminar.
9-00 hrs. — 11-30 hrs.	..	Reading of papers.
12-00 hrs.	..	Lunch.

14-00 hrs.	..	Seminar—Reading of Papers.
16-30 hrs.	..	Break for Tea.
17-00 hrs. — 18-00 hrs.	..	Reading of Papers continued.
19-00 hrs.	..	Prayer.
19-30 hrs.	..	Meals.
20-30 hrs. — 22-00 hrs.	..	Entertainments.

TUESDAY the 10th June, 1958:

8-00 hrs.	..	Open Session.
10-30 hrs.	..	Annual General Meeting of the All India Non-Edible Oil Industry Association.
12-00 hrs.	..	Lunch.
14-00 hrs.	..	Visit to the National Chemical Laboratory and Small Scale Industries Research Institute.
16-30 hrs.	..	Tea.
20-30 hrs.	..	Meeting of the New Board of Management of the All-India Non Edible Oil Industry Association.

PROCEEDINGS OF THE OPEN SESSION OF THE 3RD ALL INDIA CONFERENCE OF

The Non-Edible Oils and Soap Industry

The programme for the 3rd day of the function consisted of the Open Session and Annual General Meeting of the All India Non-Edible Oil Industry Association, presided over by Dr. Punjabrao Deshmukh. Shri R. Srinivasan, Member of the Khadi and Village Industries Commission also graced the occasion by his presence. It was the first Conference of the Industry at which he was present. This Veteran Gandhian and promoter of village industries, made a very stirring plea to the delegates for the establishment of co-operatives in the village industries field in order to bring them on more lasting lines. He also referred to the formation of the Association of the Industry on co-operative lines (for text of speech please see P. 28-31).

In the Open Session held at 8 a.m. the resolutions formulated on the 8th instant by the various sub-committees were put forth. Interesting discussions took place while considering the resolution on improvements in crushing methods. A suggestion was mooted that the Khadi and Village Industries Commission should declare a prize for evolving a more efficient and decentralized equipment in place of ghani which could be run by bullocks or by man-power. Introduction of solvent extraction method was another suggestion. Since there were no concrete bases for recommending any other suitable equipment to replace the ghani in the Industry the point did not take shape into a resolution. The resolutions put forth by the Sub-Committees were passed with slight modifications here and there. A few resolutions were rejected. (For Resolutions please see P. 21-27).

The function was over with the concluding speech by the President Dr. Punjabrao Deshmukh and thanksgiving by Shri. S. G. Shende, Secretary, to all present, as well as those who were directly or indirectly, responsible for the success of the Conference.

ALL INDIA NON-EDIBLE OIL INDUSTRY ASSOCIATION.

3rd Annual Conference at Poona on 8th to 10 June, 1958.

Resolutions

Passed at the Open Session:

Resolution No. 1. *Repayment of Loans*

The Conference is grateful to the Khadi and Village Industries Commission for financial assistance for setting up Non-Edible Oils and Soap Centres. Having realised the difficulties in repayment the conference requests that—

(i) Repayment in respect of the loan granted for non-recurring expenses as well as working capital be started after two years and

(ii) No interest be charged on working capital for the first two years.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/-Narayan Chaturvedi.
Seconded by: Sd/- Rooplal Somani.

Resolution No. 2.

Maintenance of Accounts.

The Conference requests all Soap Centres to keep proper accounts of the finances received from the Commission and also take special steps for proper utilization of these funds.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- Narayan Chaturvedi.
Seconded by: Sd/- R. V. Patankar.

Resolution No. 3.

Utilization of Funds.

The Conference notes with regret that in some cases the finances had not been utilized for a pretty long time by some of the Centres. It requests that all the unspent amount be either refunded to the Commission or the Commission be approached for revalidation of the grants by the end of this financial year. It further requests that the Khadi and Village Industries Commission should investigate into all such cases and take suitable steps to see that the centres concerned are assisted to properly spend the amounts.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- Narayan Chaturvedi.
Seconded by: Sd/- Hemant Kumar Soni.

Resolution No. 4.

Problem Centres

The Conference requests the Khadi and Village Industries Commission and the Non-Edible Oil Industry Association to investigate into the working of such Soap centres as are finding it difficult to work economically, and help them to improve their working.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- Narayan Chaturvedi
Seconded by: Sd/- Manak Chand Jain.

Resolution No. 5.

Seed Storage and Godowns.

The Conference is of opinion that for a proper working of the oil pressing centre provision for the seeds storage is essential. It further requests that a provision of Rs. 5,000/- instead of Rs. 3,000/- be made for an oil pressing unit for storage purposes.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/-Narayan Chaturvedi.
Seconded by: Sd/- Govindram Gaikwad.

Resolution No. 6.

Leasing of forests of NE-Oil seed trees.

The Khadi and Village Industries Commission be requested to take up the problem of leases of non-edible forest seed plants with the different State Governments, so that only reasonable rent is required to be paid by the Centres.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- P. C. Ozha.
Seconded by: Sd/- Govindram Gaikwad.

Resolution No. 7.

Propaganda Drive for Seed Collection.

With a view to intensifying the non-edible oil-seeds collection drive it is felt necessary to have a propaganda drive. The Conference feels that the Development Commissioners, Development Officers of Community Project and National Extension Service Blocks, and Grampanchayats be associated with this work, and requests the Commission to take suitable steps in the matter.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- P. C. Ozha.
Seconded by: Sd/- Prasadilal.

Resolution No. 8.

Intensive Pilot Collection Campaigns.

Resolved that with a view to placing the non-edible oil-seeds on the commodity market intensive seed collection drive be made. The Commis-

sion be requested to start some pilot schemes departmentally for the guidance of our centres. The Indian Central Oil-Seeds Committee may also be approached in the matter.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- P. C. Ozha.
Seconded by: Sd/- Manakchand Jain.

Resolution No. 9.

Research and standardization of Ghanis.

The crushing of some non-edible oils by the indigenous ghanis pose peculiar problems of crushing in case of certain seeds. The Conference requests the Khadi and Village Industries Commission to take up cognate research and work for the standardization of improved crushing equipments.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- W. A. Deshmukh.
Seconded by: Sd/- Gulabchand Nagori.

Resolution No. 10.

Standardization of raw materials.

With a view to exercise quality control, the Conference feels that standard raw materials and chemicals be supplied to the centres at reasonable prices. The Conference, therefore, requests the Khadi and Village Industries Commission and the All India Non-Edible Oil Industry Association to help the centres in this behalf. The Conference also feels that the result of research in respect of refining and bleaching of Ne-oils and its soaps be put to field trial at least at one of the production centres.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- W. A. Deshmukh.
Seconded by: Sd/- R. P. Sabnis.

Resolution No. 11.

Disposal of Ne-oil cakes.

The working of an oil pressing centre is dependent on the disposal of oil cakes at a fair price. Despite the fact that the non-edible oil cakes are rich in manurial contents it is difficult to get ready market for these cakes. It is, therefore, requested that the Ministry of Food and Agriculture be approached for popularising the use of these manures and help quick disposal of the oil cake since such a step would greatly enable the centres to become economic working units.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- Hemant Kumar Soni.
Seconded by: Sd/- Prasadilal.

Resolution No. 12.

Oil Extraction of Ne-oil cakes.

It has been found that oil contents in the ghani pressed cake, besides resulting in loss to the oil pressing industry, prohibit the use of cake as a manure. It is, therefore, requested to take suitable steps to see if solvent extraction method could be found feasible for extraction of oil from ne-oil cakes.

Passed Unanimously.

Sd/- P. S. Deshmukh.
President.

Proposed by: Sd/- Hemant Kumar Soni.
Seconded by: Sd/- S. B. Shah.

Resolution No. 13.

Salaries of Chemists.

The Conference expresses its heartfelt thanks for having accepted in principle the demand put forth in its resolution No. 12 of the first conference. It, further, requests that the said resolution may be implemented in its entirety and the soap units helped accordingly.

The resolution runs as follows: page 8.

Resolved that the All-India Khadi and Village Industries Board be requested to provide grant-in-aid towards the salary of Chemists for three years in succession for all types of Units, such as full, half and quarter. This step will not only encourage the centres in their work but also enable them to establish themselves on a firm economic footing.

The grant-in-aid suggested is as follows:—

	1st year Rs.	2nd year. Rs.	3rd year. Rs.
Full Unit (A class)	1,800 @ 150/- p.m.	1,200 @ 100/- p.m.	900 @ 75/- p.m.
Half Unit (B class)	1,200 @ 100/- p.m.	900 @ 75/- p.m.	600 @ 50/- p.m.
Quarter Unit. (C class)	900 @ 75/- p.m.	600 @ 50/- p.m.	600 @ 50/- p.m.

Passed Unanimously.
Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- Ruplal Somani.
Seconded by: Sd/- Karunavir Prasad Singh.

Resolution No. 14.

Exemption from Sales Tax etc.

The Conference requests the Khadi and Village Industries Commission, the Non-Edible Oil Industry Association and the different statutory State Khadi and Village Industries Boards to take up the problem of exempting the non-edible oils and soap Industry from the purview of the sales tax and octroi duties, licence fee, prevalent in various states.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- Sushilkumar Dhara.
Seconded by: Sd/- Govindram Gaikwad.

Resolution No. 15.

Concession in Railway Freight.

Resolved that the Khadi and Village Industries Commission be requested to approach the Government of India for granting our Industry a concession in Railway freight.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- Govindram Gaikwad.
Seconded by: Sd/- Sushilkumar Dhara.

Resolution No. 16.

Use of Ne-oils in other industries.

With a view to investigate the possibility of utilising various non-edible oils in different other industries including village industries the advice of some technical experts be sought and thus the production centres he helped to produce more non-edible oils, keeping the ghanis working throughout the year and thereby making the ghani units more economic.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- Gangadhar Nayak.
Seconded by: Sd/- R. D. Tiwari.

Resolution No. 17.

Co-ordination and mutual dependence among village industries.

The Conference recognises the mutual dependence of the various village Industries and requests the Khadi and Village Industries Commission, the different State Boards and others interested in the promotion of village industries to help strengthen this by mutual co-operation.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- Gangadhar Nayak.
Seconded by: Sd/- Anandi Sahu.

Resolution No. 18.

Enrolment of members of the Association.

The Conference notes with gratitude the constitution of the Non-Edible Oil Industry Association and feels confident that the Association will help further, the cause of the industry for which it has been formed. The Conference requests our non-edible oils centres and persons engaged in these to help strengthen the organisation by enrolling themselves as its members.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- Narayan Chaturvedi.
Seconded by: Sd/- Ruplal Somani.

Resolution No. 19.

Standardization and co-ordination of supplies of equipment, raw materials etc.

The Conference requests the Non-Edible Oil Industry Association to take up problems of common interest and in particular supply of standard equipment, co-ordination of the supply of raw materials and chemicals and oils at reasonable prices to the centres.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- Ruplal Somani.
Seconded by: Sd/- N. Chaturvedi.

Resolution No. 20.

Financial help for the Central Est. Expenditure Appeal to the Khadi Commission

Resolved that with a view to strengthening the All India Non-Edible Oils and Soap Industry Association, for the development of Industry, the Khadi and Village Industries Commission be requested to grant adequate financial assistance, during the initial stages to the Association towards the central establishment expenditure.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- Ruplal Somani.
Seconded by: Sd/- N. Chaturvedi.

Resolution No. 21.

Replacement of coconut oil.

This Conference notes with gratification the progress achieved in respect of eliminating the use of coconut oil from the process of soap making. All the same the Conference feels that at least for some time to come, a minimum of 20% of coconut oil is required to be used. The prices of coconut often fluctuate resulting in disturbing the cost structure. The conference therefore, requests

the Association to apply for an import licence for copra and arrange for its supply at reasonable prices to the individual centres.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- N. Chaturvedi.
Seconded by: Sd/- Ruplal Somani.

Resolution No. 22.

Government assistance.

Resolved that Government or Semi-Government orders in respect of soap be placed initially with the Association and latter should subsequently allocate the orders.

Passed Unanimously.

Sd/- P. S. Deshmukh,
President.

Proposed by: Sd/- S. K. Dhara.
Seconded by: Sd/- V. M. Raja.

Shri R. Shrinivasan

Member, Khadi and Village Industries Commission

Text of the Speech delivered on the eve of the Third Annual Conference of the Non-Edible Oils and Soap Industry at Poona on 10th June 1958.

President and Friends,

For the first time to-day I have the opportunity to attend your All India Conference. I have been watching the proceedings of the open session of your Conference since this morning. A number of useful resolutions have been discussed and passed unanimously. Some time back a chit was passed on to our Organiser, Shri. Shrikanta Rao, in which it was suggested that this Association of The All India Non-Edible Oil Industry should be formed into a co-operative. I would like to say something on this subject itself, i.e., the co-operatives for Village Industries.

As we all know, it was only last year, that we were able to form this All India Association. A proposal, rather a suggestion, is now, though not before the conference as such, mooted out, about the formation of this organisation on co-operative lines. Of course, I don't think that co-operative method is not a good one, especially, when our objective is towards building a socialistic society as such. Surely, that would be a step further in that direction and we wish to do so not in a trifling way. Co-operative method we know well, assures higher production and equitable distribution of produce, as well as, wealth and when these things are there, we know for certain that we are moving a step forward towards the socialistic ideal. Another feature of this method is that the element of exploitation is reduced considerably. That is a guarantee which the co-operative method affords for the equitable distribution of produce as well as wealth.

With the inception of the erstwhile All-India Khadi and Village Industries Board, now the Khadi and Village Industries Commission, the programme to be implemented had to be worked through the then existing agencies which had been in the field and doing their best to strengthen the

Village Industries for a number of years. As you all know, these institutions, e.g., the Akhil Bharat Charkha Sangh, the All-India Village Industries Association, etc., were registered under the Societies Registration Act of 1860. Those were the days of early 1920, when we had to fight against an alien Government, which was not at all sympathetic to the aspirations of the people, politically, socially and economically. As they were not at all sympathetic in any way, the need of the hour was to build homogeneous units and agencies which could work wholeheartedly in a particular way with unanimity of purpose and without much differences of opinion. Later on, more All India Organisations, like the Sarva Seva Sangh, Hindustan Talimi Sangh and others, only for constructive activities, were formed. It is these institutions which were in the field, doing the work of village industries, when the Board was formed. They were also equipped with the type of technical know-how required. Obviously, these institutions deserved to be encouraged and, accordingly, the finances were given to them for further strengthening and propagating their activities.

In the year 1953, a resolution came before the Indian National Congress and was officially endorsed by them in which it was declared that the co-operative method should be taken up as the pattern for various activities in our country to achieve the objective of forming a socialistic society. Therefore, we also felt that, in due course of time, the institutions which had been registered under the Societies Registration Act, should be gradually reformed into co-operatives.

There are, no doubt, differences of opinion in this matter. I mean, of reforming these institutions into co-operatives. Some people think that the registered institutions alone can do this job efficiently. Co-operatives, they argue, have too many limitations and handicaps which might ultimately defeat the purpose of this movement. This is a point which has got to be answered.

I would like to mention here one or two inherent disadvantages, that I find in these institutions registered under the Societies Registration Act, which are in contradiction to our objectives. There the power is generally vested in one person or a few at the top, and the brain of only these few persons work to guide others. I do not say that it is imperfect or bad, but it is not desirable. It may be alright so far as educational institutions, hospitals, and the like are concerned. But, it could not be so for those engaged in the commercial or industrial activities.

Let me mention here that some of these institutions have now become so big, that they are finding it difficult to develop the work further, though they have large bank balances. Probably, they seem to have reached their saturation point in every way. Mere money cannot solve our problems. The properly trained technical personnel with an urge to take up the programme is more important. These are the days of democracy. We are laying stress on decentralisation. We cannot, therefore, continue to allow these institutions to carry on somehow, simply because they had been in the field. It has also been noticed that vested interests get created in some form or shape in such institutions for obvious reasons and this tendency is disastrous for the development of a nation on democratic lines. Restrictions on individual freedom of workers get tightened and predominance of one man's authority finds its reflections in all that is done. Contact with its people, our rural folk—gets thinned considerably. That life is lost, which is essential to unite all forces together for implementing the programme.

Let me give you an illustration to bring the point further home. I was in the Charkha Sangh as the Secretary of one of its branches. I visited a few spinning centres once and I saw some spinners coming with yarn. I enquired from where they were coming. The reply was that they were coming from their Sowkar (Sahukar—money lender) to whom they had sold the yarn. "Which Sowkar?", I asked. The prompt reply was, the man with the Gandhi Cap. This is an example which shows that these spinners did not know anything about the Charkha Sangh. That feeling of oneness was absent. They could not feel that the Sangh was their own institution. It failed to inculcate this feeling because that organisation had no direct contacts with the spinners and weavers. Production work was, no doubt, distributed. But the whole administrative and financial set up had become too much centralised. That is the difficulty with which the registered institutions are likely to get confronted after some time. This can be done away with to a large extent by organising co-operatives—co-operatives of the spinners, weavers and village industry workers. Unless co-operatives are formed, the feeling of separateness cannot go. The workers' voice and interest is of paramount consideration in all that we do. They should feel that they too are indispensable constituents of the organisations. In that way alone we will be able to instil the proper feelings in the minds of the artisans. When the artisans feel that it is their industry and their institution or society they will devotedly do the job, whether they have finances or no finances. It is this kind of feeling which has to be reared in the minds of artisans.

But this transformation should be gradual, progressive and voluntary. I do not mean to suggest that these institutions cannot imbibe the co-operative spirit and methods in their programme. They can do that. But the institutions should not be too big. They should explore all possible ways and means to take to the co-operative spirit and method. They are already doing it. It should be done more properly, fully and sincerely.

Even the big institutions, therefore, have now begun to think in terms of decentralising all their activities. Their problem is, how to split up production work into smaller units and so on. They are realising their handicaps with which they are now faced. Probably, rather assuredly, a co-operative unit without the co-operative spirit and method of work, would be as disastrous. What is needed is the cultivation of the proper spirit and method, honestly, sincerely and fully, whether it is a registered institution or a co-operative society. And sooner the constituent members come to the fold of co-operatives, easier it would be for an All-India Association of this type as yours—an apex body—to become the apex co-operative Organisation.

SPEECH BY

Dr. Punjabrao Deshmukh

ON 10th JUNE 1958.

"As you know our whole organisation is such that the resolutions are required only to indicate our view point. By and by, whatever requirements and needs of persons collected here, who are in the field, will be taken into account. We are working in co-operation with the Khadi and Village Industries Commission. They know our difficulties as you know. So, don't be disappointed that your ideas are not being put up before the Commission. The problems before us have been put forth by the various speakers. We are in a position to see that from the time the Association has been formed, we have not only been able to get considerable support but also have been able to call this conference. The deliberations have indicated that the formation of this Association was very desirable. Whether it remains as a registered institution or turns into a co-operative federation, I am sure nobody will object. Nobody who is present thinks of making profit. Nobody is for profit but all for service and so I associated myself. Our whole idea is utilisation of waste. There is no much difference of opinion with the idea. So for the time being the Association continues to be under the Societies Registration Act. We are not trying to dominate. Sooner or later we will change the pattern of our society. Somebody will turn this into a co-operative. I am glad that Sri. Srinivasanji has lightened the work of a Minister (for Co-operation). I assure him that we will turn this into a co-operative federation."

Dr. K. Venkatraman speaking

The Reception Committee and Volunteers

INVITEES AND DELEGATES

3rd All India Oil Industry Conference and 2nd Seminar, Poona

Seated *(on chairs)* **from left to right :**

1 Dr. K. K. Dole
2 Dr. R. P. Sabnis
3 Sri Bindubhai Desai
4 Sri K. Vaidyanathan
5 Sri M. L. Agarwal
6 Dr. J. G. Kane
7 Dr. P. S. Deshmukh
8 Mrs. P. S. Deshmukh
9 Sri P. S. Kapadia
10 Dr. C. R. Mitra
11 Sri B. G. Pendharkar
12 Sri S. R. Londhe
13 Sri P V. Shrikanta Rao
14 Sri S. G. Shende

Proceedings of

The Second All India Seminar

Of The Non-Edible Oils and Soap Industry

Held on 9th June 1958.

The feature of arranging seminars for the Industry was initially introduced at the time of the Second All-India Conference held at Sadhana Mandir, Bolarum, Hyderabad in March 1957. The present seminar being the second of its kind, was a privileged occasion, in view of the participation by eminent scientists like Dr. K. Venkatraman, Director, National Chemical Laboratory, Poona, and Dr. J. G. Kane, Reader, Oils and Fats, Department of Technology, University of Bombay. The seminar was inaugurated by the former and presided over by the latter. Besides these two, a number of other scientists also participated in the Seminar. Shri P. S. Kapadia, Member Secretary of the Khadi and Village Industries Commission was also present on that day by special invitation. He took an active part in the debate and also addressed the delegates at the request of Shri Shrikanta Rao. (For the text of his speech vide P.40.) The proceedings of the Seminar began with an introductory speech by Shri Shrikanta Rao. (please see P. 36.).

Shri A. M. Lele, Convenor of the Seminar Sub-Committee, then welcomed the distinguished guests and delegates. Thereafter, the Chairman formally requested Dr. Venkatraman to inaugurate the Seminar. Dr. Venkatraman, in his erudite address (pl. see P.38.), observed that the problems of the utilization of non-edible oils better known as inedible oils, should be tackled on the basis of a three point programme, namely, rendering them usable, exploiting all possible by-products obtainable and substituting them for edible oils in industrial uses. Mentioning that research on various non-edible oils is being conducted at the National Chemical Laboratory, Poona, he concluded by adding that technological research need not necessarily be confined to large scale industry, although its application on a small scale may be wrought with obvious limitations.

Later, Dr. Kane requested the participants in the Seminar, to state the contents of their papers in brief as the time at their disposal was short.

After the reading of each paper time was allowed for discussions. The fifty papers to be read were grouped under five main categories, namely collection of oilseeds, oil-pressing, disposal of oilcakes, production, standardization and sales of products and co-ordination with other village industries.[1]

Group I:—Collection of Oilseeds:—[2]

Papers were read by Shri P. V. Shrikanta Rao, Shri Hemant Kumar Soni, Shri K. G. Shimpi, and Shri Jagatsingh Raut. Initiating the discussion on the subject of commercialisation, Shri Sharma from the National Chemical Laboratory, gave instances of Kamala, Tobacco and Sitaphal seeds, which were being neglected in spite of their importance as raw materials for paints and varnishes. He complained that while the existing trees of Kamala Seed are not being protected by Government, it is taking steps to import seeds from China and America for plantations in India. As regards Sitaphal seed, Shri P. V. Shrikanta Rao disclosed, in reply to Shri Sharma's query, that he was in correspondence with the Andhra Pradesh Government. However, some difficulties were being experienced in collecting these seeds and in extracting oil from them. A paper read by Shri P. C. Ozha on experiments on Neem Seed collection revealed the importance of proper and careful collection, drying and storing of Neem seeds. Papers on "Ratnajoti", "Undi", and "Three Non-Edible oilseeds" were read by Shri P. V. Gujarathi, R. V. Naik and Dr. K. K. Dole, respectively.

Other papers read later in the evening on this subject suggested that Government should amend its policy to protect and increase the non-edible oilseeds bearing trees by banning their cutting down as well as by fresh plantation by means of Vanamahotsavas etc. The general complaint was that the Forest Department Officials did not respond favourably with regard to grant of contracts for collection of non-edible oilseeds.

Group II—Oil Extraction:—[3]

Under this group technical papers on Mohwa seeds crushing, chemical investigation of Neem and their utilization and also on different oil extraction methods were read. The delegates evinced considerable interest in these instructive papers, especially in the first two which hinted at removal of the practical difficulties in Mohwa crushing and Neem Oil refining. During discussions with regard to the oil extraction by ghanis, the Seminar felt the urge for remodelling the present modes of crushing so as to improve the

1. The original grouping has been revised.
2. For the text of papers vide PP. 43 to 58.
3. —do— 59 to 69.

economy of the centres by increasing the yield of oil and resorting to solvent extraction of oilcakes, if necessary.

In the course of the discussions on this topic, Shri P. S. Kapadia emphasised the significance of decentralised methods which achieve the golden mean of providing greater employment with comparatively less investment. This view was supported by Shri Anandi Sahu of Bihar. He said that in his area Mohwa was crushed both by ghanis and by mills. The percentage of oil yield by expellers came to only 2 to 3 p.c. more than ghani crushed oil. Apparently, this advantage in favour of expellers was quite negligible compared to the heavy expenditure one has to incur on them. The point of greater co-ordination between this Industry and the Village Oil Industry was stressed with a view to achieving economic working of the centres.

Group III—Production, Sales and Standardization:—[4]

Under this group papers on sales of soap and experiences in soap making were read. Shri. G. M. Kelkar read a paper on use of non-edible oils in soap making. Certain salient points were dealt with by Shri V. R. Joshi and Shri V. P. Nadkarni while reading their articles on standardization.

Group IV—Co-ordination with other Village Industries:—[5]

Shri G. G. Nayak made some concrete suggestions to bring about this co-ordination. He referred, in particular, after giving examples to Village Oil, Leather and Palm Gur Industries.

The paper on Research and Development in the Non-Edible Oils and Soap Industry[6] by Dr. R. K. Shrivasthava and Dr. M. Sadashiva Rao of the J. B. Central Research Institute for Village Industries, Wardha was also read. A good idea on the future lines of research development under the said Research Institute could be gathered from this paper. Some of the experiments like those on evolving an efficient depulper and drying of Neem seeds by methane gas, as well as on more efficient processing methods of other oilseeds as indicated in the paper are capable of changing the outlook of the Industry entirely.

Papers on by-products of Soap[7] were read by Shri B. M. Desai and others.

The Session concluded with a short speech by the Chairman in which he appreciated the work conducted by various delegates and thanked them for having presented interesting and thought-provoking information.

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4. For the text of papers vide PP. 70 to 74.
5. —do— 82 to 86.
6. —do— 77 to 81.
7. —do— 75 to 76.

Introductory Speech

by

Shri P. V. Shrikanta Rao,

Organiser, Non-Edible Oils and Soap Industry at the 2nd Seminar on 9th June 1958, 8-50 a.m.

I am very happy and feel honoured to welcome you amidst us this morning on behalf of the Khadi and Village Industries Commission, All-India Non-Edible Oil Industry Association and on my behalf on the occasion of the 2nd Seminar of the Non-Edible Oils and Soap Industry. I am particularly grateful to Dr. Venkatraman for his having so kindly consented to inaugurate the Seminar.

I do not propose to mention here in detail about the different problems, organisational, financial, technical and commercial, which confront our Industry in some form or other. I feel it necessary to stress the fundamental principles, which are the corner-stones of the line of approach to tackle our problems. The first and foremost among them is the ardent desire and earnestness on the part of our production centres, to resolve to manufacture quality products that would satisfy the requirement of the prescribed standards set by the Indian Standards Institute. Our centres are prepared to accept any technological improvement both in the selection of raw materials as well as in the adoption of equipment, of course, keeping in view the aims and objects, with which the programme has been undertaken by the Khadi and Village Industries Commission.

It will not be out of place to mention here that in order to give concrete shape to these problems the Khadi and Village Industries Commission have, on my advice, appointed the Quality Control Advisory Committee under the Chairmanship of Dr. J. G. Kane, one of the few experts and authorities in this field. This committee has among other members, Dr. M. S. Rao, Dy. Director, Village Industries Research Institute, Wardha, Dr. R. P. Sabnis, Shri. B. M. Desai, Shri. B. G. Pendharkar, former Manager, Swastik Oil Mills, and Dr. C. R. Mitra of the National Chemical Laboratory, Poona.

I am thankful to Dr. Venkatraman and also the Council of Scientific and Industrial Research for having consented to nominate Dr. Mitra on the Committee. The Committee had so far held two meetings and had given very valuable advice for the improvement of the Industry. A programme for conducting tests of products, as frequently as possible, has also been chalked out and to that effect facilities are being provided. Our technical officers in the field are also being provided with testing kits, so that they could test these samples, whenever they visit the production centre, or by obtaining the samples from the market. The question of providing each production centre with necessary equipment so that they could test their samples is under consideration. It is also proposed to establish a central laboratory attached to the Non-Edible Oil Industry Association which would co-ordinate and guide the working of the regional laboratories.

The Committee has also collected the formulas of soap production from all our centres throughout India and the same are under examination. The reports of analysis of different samples are also being studied by the Committee members and very soon steps would be taken to see that uniformity in the production is maintained by our centres, as far as possible.

Development of simple equipment and methods of tests which would give for all practical purposes, as reliable values of quality as the most expensive and elaborate testing methods, existing, could give, is an essential requirement of the day.

Although the introduction of quality control enables one to improve methods of production, a direct plan for the improvement of the production technique, by means of efficacious methods and tools of production will have to be thought out. In case of village industries one can easily expect that even a re-organisation of the use of resources and introduction of improved methods and tools could effect a remarkable increase in productivity with little addition to investment. The desired productivity in a village industry centre should be defined, as the maximum possible output of goods of standard quality with the existing set up of tools and methods and resources including the man power. A re-organisation, as stated earlier, can be brought about by a careful study of the existing conditions in a large number of cases and in this direction the significance of such seminars is surely beyond measure, particularly when I find that scientists and technologists of eminence have been pleased to participate. All this augurs well for the Industry.

Inaugural Speech

BY DR. K. VENKATRAMAN, DURING THE SECOND ALL INDIA SEMINAR.

Dr. K. Venkatraman, Director, National Chemical Laboratory, while inaugurating the seminar organised during the Second Non-edible Oils Industry Conference, observed that 'The *per capita* consumption of fat in diet in our country is much below the required nutritional level, and as such use of edible fats for manufacture of soaps, etc., should be discouraged so that they may be available for edible purpose only. Utilization of non-edible oils in the soap, stearin and allied industries would eventually realise considerable quantities of edible oils from these industries. It is, therefore, needless to stress the importance of organised efforts to collect the non-edible oilseeds, develop the suitable methods for processing these seeds and production of the oils therefrom. It is only logical that priority should be assigned to those oilseeds and nuts, such as those of *neem, karanja, undi, Nageswar,* etc, which are of extensive growth and thus available in plenty.

"It is heartening to note that the Khadi & Village Industries Commission and the Indian Central Oilseeds Committee have now undertaken effective schemes at the instance of the Planning Commission to survey the availability of these raw materials, and to organise collection, processing and pressing of the non-edible oilseeds.

"The problem of utilization of the non-edible oils for industrial purposes comprises not only of instituting proper organisation for collection, storage and processing of the seeds and nuts, and to resort to the best method of pressing, but the most important aspect of the problem is the purification and refining of these oils, so that fats free from disagreeable taste and odour and dark colour, are available to Industry. In order to achieve success in this respect, the non-oily constituents responsible for these undesirable properties often present in these oils are to be separated from the seed glycerides by effective methods which are comparatively simple and economic. Con-

siderable amount of systematic work has been carried out by Dr. C. R. Mitra in the National Chemical Laboratory, on a number of important non-edible oils and the processes developed as a result of this research programme appear to ensure fuller utilization of the fat resources and also of the medicinal constituents present in these oils. As, for example, the active bitter constituent of nim oil, *nimbidin* is an important product having promising therapeutic values.

"As you are aware, most of these non-edible oils are reputed for their medicinal properties while the glycerides of these fats are composed of common fatty acids, the medicinal values of the oils are due to the presence of non-glyceridic constituents of varied chemical nature. Thus systematic chemical investigations on the non-edible oilseeds as pursued by Dr. Mitra are essentially needed to develop suitable methods for utilization of the oils and their important by-products; conventional methods are not of much use for refining of non-edible oils.

"Dr. J. G. Kane has worked on *pisa* fat which is a very rich source of lauric acid. I am glad to see that attempts are being made to organise collection of *pisa* and *khakhan* seeds, fats from which when properly processed, would replace coconut oil in soap industry.

"The importance of non-edible oils and soap industry cannot be over emphasised. Nevertheless, one has to realise some difficulties in operating certain chemical processesses on village industry scale. There is, however, no reason at all why improved scientific and technological methods should not be taken advantage of even in small and cottage scale industries. I am very happy to assure that the National Chemical Laboratory will always be willing to co-operate and undertake extensive programmes for the Non-edible Oils and Soap Industry. Our programme should be to improve the scientific and technological aspects and I hope to get necessary help in this regard from the Indian Central Oilseeds Committee as well.

"I am sure that the deliberations and discussions on various papers in this seminar will be much helpful in realising the importance of and in solving the different problems facing this industry.

"I am much thankful to Mr. Shrikanta Rao for giving this opportunity to be with you this morning and inaugurating this seminar."

Address to Delegates

BY SHRI. P. S. KAPADIA,

Member Secretary, Khadi and Village Industries Commission, Bombay

On 9th June 1958.

"Since morning discussions on various aspects of the Industry have taken place during the course of the Seminar, in which I also participated. I am taking this opportunity to speak to you at the request of the Chairman, Shri Shrikanta Rao.

"Your industry is one among the eleven industries undertaken by the Khadi and Village Industries Commission. The collection of non-edible oil seeds in your industry is something like recovery of carcass in leather industry. For us soap-making is quite incidental. Our main idea is to utilize the wasted non-edible oil-seeds, at the same time increasing employment in villages. Of course, employment is part time for seed collection though it is full time in soap making.

"By such types of schemes, the employment position in India can be improved and with the same idea the commission has been formed. According to the 2nd Five Year Plan about $1\frac{1}{2}$ crores of additional employment opportunities are expected to be created. But these estimates are based on the data collected through employment exchanges. Food and clothing have to be provided for the entire population. Though providing food grains etc. does not come under the Commission's purview, we can help to improve the economic condition of villagers by means of the ten village industries undertaken. To achieve this, our contacts with the villagers should be strengthened. However, no progress can be brought about unless the villagers themselves take interest.

"Taking population statistics into account, it is clear that out of the 44 lakhs of population in service 20 lakhs are Government servants. Out of the remaining 24 lakhs, 8 lakhs of people are from the Textile Industry. While these workers produce 700 crores yards of cloth as against a wage-bill of Rs. 150 crores, on the other hand, if Rs. 150 crores worth of cloth is produced by Ambar Charakha, we can give Rs. 100 crores as wages to 50

lakhs of people. Our main objective is to increase the employment potential. Our friend from Bengal said some time back that since we are creating wealth out of waste our main objective is not that of inrceasing employment. But that is not correct.

"In the course of discussions our friend from Hyderabad said that we expect profits from business only because we have to repay loans. This businessman's mentality can be diverted towards producing soap at less production cost rather than earning undue profits. In case of those centres who do not want to work, the money taken from the commission should be returned immediately. Our only idea is to see that funds given by the Commission are utilized for a good purpose.

"You might be knowing that the average annual per capita income in India is Rs. 285. In towns the monthly income comes to Rs. 850, whereas in villages it comes to only Rs. 150/- per month. This sort of arriving at averages is surely very misleading.

Actually, there are vast differences in income and these will have to be wiped out if we want to create a healthy atmosphere in the country. If you go to the villages, you will find that sometimes there is only one sari in the whole family which is worn by the ladies turn by turn when they go out. The type of work you all are engaged in, is to help such people. We think of increasing production but unless these people get reasonable wages, our objective will not be achieved. We have gained independence after a long struggle, we have yet to attain economic freedom.

"In India, cloth consumption is estimated at 15 yards, per capita per year, whereas, it is somewhere near 6 to 7 yards, only. In Adivasi areas cloth consumption is below $2\frac{1}{2}$ yards. Even then on account of this cloth purchase large amounts of money are passed on to the cities like Bombay and Calcutta. In the same way, we have to think about soap and other commodities produced in towns and cities, which command a good market in the villages. It is necessary to stop this movement of currency.

"Today there was some discussion on marketing. Here I would like to quote Dr. Kane who rightly said in his speech that we are selling cleanliness. All of you must realise that this transaction should take place in the heart. It is always to be borne in mind that you will be successful only when you go to the people with the feeling of service rather than that of a businessman. If you go with the latter attitude, you will be faced with competition and the scheme will then be a failure.

"Now about our oilseeds. I have already told you that coconut oil is beyond our means. We should, therefore, collect the available non-edible oilseeds and give employment to the unemployed. To organise seed-collection is a very lengthy process. To encourage seed collection, it is necessary to attract people by giving them their daily requirements like salt, eatables etc.

"The price for seeds should be fixed for the entire season. In case others buy the seed at a higher price, there is no need to worry. Another important point is that wages should be paid to the collectors promptly. If you change your purchase price, you will become undependable in the eyes of the collectors. Of course, they will be pleased if you buy at a lower price in the beginning and at higher prices later on. As regards storage of oil-seeds, the annual requirements should be estimated carefully. Under the Non-Edible Oil Industry programme the Commission gives a grant of Rs. 3,000/- for godown, as against Rs. 500/-, for village oil ghani. In case your requirements are in excess of the amount granted, there should be full justification for it so that the Commission can consider your case.

"Many difficulties are experienced in crushing the Neem Seeds, which you have to think over. Since you are in touch with cultivators, the oil-cakes useful as manures can be sold locally. So far as using edible oils for soap making is concerned, they should not be used at all as far as possible and in any case not more than 15 p.c. of such oils whose non-edible counterparts are not available.

"One thing in favour of gramodyoga products is their purity. For example, in case of Khadi and handloom cloth people prefer them to mill-made cloth, on account of their good quality. We have to create such conditions for soap also. There cannot be any difficulty in marketing the soap if a reasonable margin of profit is maintained. In order to reach that stage your overhead expenditure should not exceed 12 p.c. Moreover, greater co-ordination of all the village industries will be helpful for furthering sales as these villages industries are interdependent for many raw material requirements. Again, if your products are standard products, I do not think there will be any difficulty in selling them.

"Lastly, I will request you to bear in mind that we cannot be successful merely by business tactics. In the beginning utilization of Neem Oil in soap-making was thought to be impossible. We have shown that it is also possible. We should convince the Planning Commission that we have been successful in our scheme and I hope you will offer your mite in achieving it."

Seminar Papers

Collection of Non-edible Oilseeds

Group A. DESIRABLE POLICY WITH REGARD TO :

(1) Concessions for the Collection of Ne-oilseeds.

(2) Preservation of Non-edible oil trees.

(3) Plantations — new, with actual experiences, if any.

Paper I

By Shri Y. P. Rao.

Development Officer, Non-Edible Oils and Soap Industry,
Khadi & V. I. Commission, Bombay State.

(1) Concessions for the collection of Ne-Oil seeds :

The collection of non-edible oil-bearing seeds was in vogue since ancient times providing very meagre employment. This has received a good fillip after the establishment of the Non-edible Oils and Soap Industry.

During the course of the past two seasons, seed collection work, mainly that of Neem seeds, was undertaken by many centres. From the actual field experience the following points stand out clearly :

(i) It is observed that there is a general appreciation among the villagers for the scheme which aims at giving wages for collecting the ne-oil seeds.

(ii) The overall response of villagers for the actual work is rather encouraging.

(iii) None the less, considerable difficulty is experienced by centres to induce villagers to take up seed collection work, perhaps for want of publicity.

(iv) The wage received by villagers is far less than what is obtainable through other avocations.

(v) There is competition from mill pressers at some places who offered 75-100% more wages than what our centres could possibly pay. This competition is growing every year, as perhaps they find it more economical to replace costly coconut and groundnut oils.

(Other findings are not relevant to be mentioned here.)

From the above observations it can clearly be gathered that villagers cannot be enthused merely by sentimentalism when they realise that seed collection is not sufficiently remunerative. An assurance of higher seed collection wages, produces not only a good response among villagers, but also contributes considerably to the quick success of our scheme. The average rate that our centres can pay for one Bengali maund of Neem seeds does not exceed Re. 1-4-0. To find popular response the same should be raised to Rs. 2-8-0, taking into consideration the constant rise in the living cost. The challenging question is whether our centres can afford

to pay this. Obviously, no ! In order to solve this difficulty, the difference of Rs. 1-4-0 should be subsidised either by the State Governments directly or through the respective State Boards. The above suggestion is in addition to the production subsidy to be paid by the Commission.

It cannot be over-emphasised, that our Industry should be so planned in its technical aspect that any centre must be able to pay its way. Unless this stage is reached, it is quite impossible to pay Rs. 2-8-0. It is found necessary that, to encourage our centres, it is imperative that they should be enabled to pay a responsive wage towards neem seed collection.

Considering the next major ne-oil seed, namely Mohwa, the organisation of its collection is different from that of neem seeds. The nature of protection that is needed is against monopolies by big merchants who are in a better position to obtain contracts from the Government Departments. Our Soap centres, in a majority of cases, have to purchase their Mohwa seed requirements at exhorbitant rates in the market. Thus, in order to enable these centres to obtain their Mohwa seed requirements directly, respective State Governments should be approached for reservation of forest ranges for exclusive collection of seeds by our centres. The pattern of Mohwa seed collection is different in the sense that seed collectors accept remunerations in kind rather than in cash for their labour. This may necessitate opening of grain shops by our centres for the purpose. Thus, additional Working Capital may be required by them.

(2) Preservation of Ne-Oil Trees :

It is not an unknown experience that Ne-oil seed bearing trees, especially Mohwa, are indiscriminately cut for timber. For example, in the Panchmahal District of the Bombay State over 3 Lakhs of Mohwa trees were cut down in about 4 years time and the same is going on at great pace even now. Similar are the experiences we had come to know through our field staff in different parts of the country. If the practice of cutting down trees is accelarated, as is the tendency at present, soon our Industry may have to rename itself as Edible Oils & Soap Industry ! It is, therefore, an urgent necessity that State Governments may be approached for the protection of these trees,.

(3) Plantations :

It is necessary to systematically cultivate the plantations of these trees, especially where climatic and geographical conditions are conducive. Plantations of these trees serve a dual purpose of increasing the forest wealth which is necessary to-day and of making available the non-edible oilseeds as well.

The importance of Vanamahotsava, in our case is, therefore, all the more obvious. The Development Officer at Bombay, had organised one for Non-edible oil–seed trees in the month of July, 1957. Detailed instructions were given to centres. The response given by some of the centres was very encouraging. Special mention may be made of the Intensive Area, Sanwad (Dt. Udaipur, Rajasthan) for the very enthusiastic way they carried out the Vanamahotsava. They had planted 200 Neem plants. Moreover, good Castor seeds were distributed to farmers for being planted during the season. They are getting ready one small nursery for Mohwa, Karanja and other types of Non-edible oil seed plants.

Shri. Siddeshwarnath Modi, Organiser, of the above Intensive Area, had given a few very valuable suggestions in connection with the Vanamahotsava which are worth considering. They are :-

(i) With a view to plant Non-Edible Oil seed trees at different places, arrange-

ment for nurseries should be made in each state.

(ii) Just like a palm plantation unit a plan should be chalked out to assist each and every Non-edible Oils and Soap centre in looking after the saplings planted during the Vanamahotsava.

(iii) The trees found in different areas should be sent to be planted in other areas where the climate is favourable to them.

(iv) In monthly progress reports of Ne- oil and Soap Industry few columns regarding Vanamahotsava may also be added.

Paper II

By Dr. K. K. Dole, M. Sc., Ph. D.,
Professor of Chemistry, Fergusson College, Poona.

The insufficiency of edible fats in the Indian diet, created on account of utilizing edible oils for non-edible purposes, has prompted many to utilize some of the commonly known non-edible oils, like those of Neem, Karanja, Khakhan, Mohwa, Undi and Pisa. Since the scheme for utilizing seeds is advocated by the Khadi and Village Industries Commission, side by side with their edible oil scheme, these two schemes should be amalgamated. Secondly, since these oilseeds are difficult to collect and are not of any special advantage, though abundantly available, seeds which can be raised in the form of crops at one place e.g. argemonne mexicana, Xanthium strumarium, Ricinus communis, etc. should be preferred as well as encouraged for being planted. However, care should be taken to see that land under food crop cultivation is not diverted on that account. Therefore cotton-seed oil, rice bran oil and such other oils should be advocated.

Group B. COMMERCIAL COLLECTION OF NON-EDIBLE OIL SEEDS

Paper I

By Shri V. K. Balkrishnan Nair,
Supervisor-cum-Chemist, Khadi & Village Industries Commission, Kerala State.

The whole success of our Industry programme depends upon how we exploit the seed collection season. We have seen that our Soap units can easily achieve their targets of soap production and sales, but that is not the basic idea with which we have started our scheme. Our scheme is to fully exploit the non-edible oil seeds available in our country and to make use of them in the various industries, and not necessarily in the soap industry alone. There, I am afraid, we have not done much. Hitherto, the centres had been concentrating more upon the production of soaps and not on seed collection. There are some centres which have done well in soap production but not collected a single bag of seeds !

While announcing this fact, we have to investigate what stands in their way of seed collection. Are there not enough seeds in the locality ? Or , are their earnest efforts lacking during the season ? Or, do they suffer from any competition in the field ?

While the former two reasons hold true there in some cases, I have seen that the third one, namely, competition from big merchants is the main reason for the failure of the centres in the collection work. All our talk of opening collection centres in the villages by these soap units, appointing agents or supervisors for the collection work etc. proves to be of no avail when these schemes are sought to be put into practice. Our small centres cannot stand in competition with the big merchants who have already established monopoly in the field. These big merchants advance money to the local people through local 'chotta' merchants who are well-known to the locality through their business. By the time our centres start planning seed collection during the season, the local merchants would have already 'booked' these people. Moreover, our units cannot invest such huge sums for the collection work.

It is indeed here, that the Commission has an important part to play. Under the present commercial method of collection the merchants make huge profits by cornering the seed stocks. We can surely replace this method by organising seed collection societies which should open depots at key points. Of course, the Commission must advance the money as the 'Bada' merchants do. Then these regional Depots should feed the crushing units and put their ghanis into operation.

We should enrol the local oil mongers as members of the society. Only the Commission's staff must be there with money to act as 'Bada' merchant during the season. Unless we plan for some such system for the commercial collection of non-edible oil seeds, our venture, I am afraid, cannot be successful.

Paper II By KUMARI K. D. HERVATTE

Introduction :

Though this paper is on commercial collection of Ne-oil seeds many of us know and have seen that there is actually no large scale collection on a commercial basis. For such a state of affairs there can be only two main reasons, either because the operations of collection are to be carried out on a scattered and wide area compared to the quantity of seeds obtainable so as to make it impossible for management, or because the demand for these seeds is not coming forth from the sector of Industry which will require fixed quantity of seeds per year and will be prepared to have it at all costs. Both the causes play their part. However, the conditions in certain areas are now undergoing a change due to the Commission's encouragement for collection of these oilseeds. As such, those areas will have to be dealt with as a different group.

Agricultural Crops and Finance :

The formation of a trade organisation in agriculture is usually comparable to a pyramid in the sense that the bottom rung is made up of petty producers and their distribution comes into the hands of a few at a later stage. There can be no substantial difference in organisation for edible oilseeds which are agricultural produce and for non-edible ones which are to be procured from trees. Only the processes involved before marketing will differ. Agricultural oilseeds are grown in farms as independent crops or are grown mixed with other crops. They are harvested, decorticated, etc. (except groundnut) on the farms without encumbering heavy costs to the cultivator, as in a number of cases these form a subsidiary crop. Where these crops are grown independently, it is because the cultivator is sure that his produce will find a ready market in the country or abroad.

As far as employment is concerned, one will be surprised to find that in case of groundnut cultivation, the cultivator is busy only for 3 to 4 weeks in a year (after counting actual hours of work done). There will be some expenditure for seed, labour and above all there will be risk bearing till the crop is matured and harvested.

Non-edible oil-seed Trees and Finance :

Compared to all this one will say that for the collector of ne-oilseeds the investments are made by nature which stand in the shape of fruit-laden trees. He has to collect them when the seeds mature, clean them and dispose them of in the local market. His only investment will be in the transportation of seeds. When it is so easy why is it that the villagers will not get the incentive as in the case of agricultural crops? Not that these seeds are new to them, but that they want a favourable response from the demand side. It is not that our people are very slow at catching new ideas, even groundnut which has formed a part of our day to day requirements in the form of oil was introduced in India only a century or so back. Collection of neoilseeds is a seasonal operation which may last from 15 days to 2 months. In order to have a greater out-turn, the collector will have to work ceaselessly and benefit to the fullest extent. The seasonal nature again implies that there cannot be any marked number of persons who can be stamped as collectors. The area of operation will be determined by the existence of trees either in private or in Government areas. Sometimes it becomes difficult to estimate the amount of seed the trees may yield and the organisation required for it due to the scattered nature of these trees.

Feeding areas to assembling markets :

About collection in private areas either the owners must be conscious of arranging their collection or the Organisers of collection must have knowledge of their existence. In Government owned pockets or forests one has to abide by the rules and regulations laid down by the state forest departments. A few details about this point will not be out of place.

Levies :

The so far collected ne-oilseeds, either individually or to some extent commercially, are Neem, Karanja, Mohwa and Undi, of which the first type of trees are found only in habituated areas, on road-side, parks, private compounds etc. Karanja is both on roads and in forests. The last two, namely Mohwa and Undi, are found only in forests. The question of obtaining permission from Government arises only in case of forest-grown trees. The rates levied by forest departments are not based on any economic considerations. In many cases their rate structure and system is quite outdated. For example, in case of Mohwa, contracts for collection are given on tender basis for collection of a particular quantity only. It is another thing whether this fixation of quota has been done after assessing the quantity of seed that may be available in a particular area in a particular year. In some other instance I have come to know that the forest department is thinking of increasing the rates because they found the demand for them has increased. So far there was no definite policy with regard to levies. In such instances one cannot help saying that, whatever might have been the forest department's policy so far, now they must have a comprehensive and liberal outlook in such matters.

Specialisation :

Now, turning to the trade organisation, the practices for all these oil-seeds are the same, though their application is relevant to a particular seed only in a specific area, e. g. Mohwa in Madhya Pradesh., Karanja

in Mysore, Undi in Kanara. Though found in many other parts of the country the commercial pockets have been formed in certain areas only. Karanja pressing has developed due to its growing demand for leather tanning industry of Mysore and Madras States. With the steady demand a number of even medium-sized mills have devoted themselves to Karanja crushing the whole year round, leave aside the indigenous ghanis. Nevertheless the collection organisation has not undergone any considerable changes.

Trade Organisation :

The individual collector forms the first link in this trade organisation. He may either be working on a daily wage basis for a contractor or collecting by his own initiative and then selling off the quantity either daily or once a week or so to the local merchant. In case the seed has to be exported, the merchant has arrangements with the adatayas or commission agents or agents of buyers which is the third link. But this outisde demand may not be regularly coming forth. A large proportion goes to village telis in which case the oil will be used locally or sent to nearby places to some extent. The price trends of these oilseeds would have thrown considerable light in the importance of these oilseeds and their demand. Unfortunately the price statistics records have no where been maintained at the lower levels. One can get only the prices in the terminal markets, at which place the prices are influenced by external factors, like prices of other oilseeds, general price structure, Government's policy etc. These prices do not throw any light whether the changes are due to changes in supply or in modes of collection. The changes at the higher levels, are rarely passed on to the collector, so that his collecting activities are not guided by demand but by his own need for extra income to meet his day-to-day expenses.

Another side of the picture is by means of encouragement by the Commission through its soap centres. In this case the supply and demand for oilseeds are artificially stimulated for some purpose, simultaneously. The centres are the interested parties whose work cannot go on unless the oilseeds are procured and stored carefully every year. They can pay the collectors for the quantity collected or purchased through some agent who has been given the contract. Here the destination and demand are certain. The wage for the collector is fixed at par with what a paid labourer can get at other agricultural operations per day or in proportion to prices of the seed in the market. This wage will be quite different from that in the already existing collection practices, in the sense that here the labour has to be attracted from otherj obs. (This statement may apparently look absurd since the general impression is that there is a large number of unemployed persons in the villages; actually each one has something to do but is underemployed and cannot get enough remuneration to meet all his domestic requirements.)

Comments - Future tendencies :

Every year the number of centres under the Industry has been increasing and these centres willl play an important part in forming the future commercial organisation for the collection of oilseeds in their individual capacity and through the All India Non–Edible Oil Industry Association. The artificial stimulation has to end one day and a class of collectors formed who will do their job every year efficiently. There will rise among them some leaders who will finance the collection and transportation operations. One cannot exactly say how this organisation will evolve.

The sector from which the collections are likely to be financed, as well as Government's, particularly the forest department's

policy will determine the type of organisation, to a very great extent. A sudden increase in demand for these oilseeds from the large scale private sector may bring forth a lot of investment in this sphere. The cleaning, storing and transporting operations which at present are done with least possible expenditure on a small scale may be replaced by more efficient ones. The investments may come permanently through building of godowns near collecting places, appointment of agents, formation of mandis. These are only some of the changes that can be guessed. In the same way the forest department may give contracts for larger amounts to bigger contractors and so on. But this may come in after a very long time and it may bring in exploitation of labour and such other things.

At this juncture the Commission's or the centres' steps may differ, as their programme is based on providing additional remunerative employment to the unemployed and under-employed agricultural classes..

Group C. A FEW UNCOMMON NE-OILSEEDS.

A NON-EDIBLE OILSEED—RATNAJOTI

Paper I

By Shri P. V. Gujarathi

Dy. Organiser, Non-edible Oils and Soap Industry, Khadi & Village Industries Commission, Bombay.

Ratnajoti :

Name : Botanically known as "Jatroha Euphorbeacea"

Name : The plant is locally known in different languages: *Chandrajoti*- Madhya Pradesh; *Parshi-Erand* or *Modli-Erand*- Hyderabad and Bombay: *Audi*-U. P. *Availability* : This is a wild plant, grown abundantly in different parts of Hyderabad, Madhya Pradesh, Bombay and Uttar Pradesh and might be available in such areas which are suitable for the growth of Castor plant.

Nature : The Ratnajoti plant is similar in nature to castor plant. It grows nearby the villages and in waste tracts. The branches and trunk of the plant are soft and the leaves are small in size. The tree can be transplanted in any part of the year. The tree flowers with the advent of spring (Vasant) i. e. some time in March and bears fruits which start maturing in November or December. The colour of fruit is bright yellow. The size of the fruit is about the size of a small lemon. It is round in shape with a diameter of about $\frac{1}{2}''$ to $\frac{3}{4}''$. The fruit is made of 3 to 4 compartments. In each compartment one seed is placed. The size of the seed is like a bold castor and is of the same shape. The colour of the seed is black. The seed is not lustrous like Castor. Inside the husk lies the soft white kernel, of the same size.

Collection : The collection of the seeds is very easy and a person can collect seeds worth one to two rupees per diem depending upon the growth of the trees. The ripe fruits are plucked from the tree. The fruits are then dried in the sun. This helps

in breaking up of fruits. Thus dried fruits are broken open and the heavy seeds are separated from the upper light husk. On an average one tree gives about 2 seers of seeds.

Drying and Storage : The seeds aie then well dried. This can be done by spreading the seeds in a thin layer, open to sunshine. It takes about a week to dry. The driage is about 20% if the seeds are fresh. The dried seeds can be stored in gunny bags and in well-ventilated airy godowns. There is little difficulty in storing these seeds, as these can be dried well without any difficulty, the season being very dry.

Oil and its extraction :

The seeds have got comparatively less oil content. On an average the seed has about 30-35% oil (by solvent extraction method.) On account of poor oil content, crushing by ghanis is difficult and not more than 20% of oil yield can be obtained. Secondly, while crushing, because of its soft nature, it slips and moves with the 'lat'. It requires a larger percent of water and if fibrous material like bamboo chips are added, it helps in getting a slightly higher yield.

Decortication and its importance in Oil Crushing :

The total percentage of oil by solvent extraction is about 30% which makes crushing of undecorticated seeds un-economical compared to other oilseeds having oil percentage higher than 40, thereby, increasing the cost of crushing one and half times. The seeds, if decorticated, can reduce this cost of crushing to a great extent. Moreover, the colour of the oil will also be improved. This can very clearly be seen from the following analysis of the seeds. *

Seed :-

Moisture	...	10 %
Husk	...	40 %
Kernel	...	60 %
Oil on the whole seed	...	32 %
Oil in the Kernel	...	52 %

From the above analysis it can very well be seen that the extractable oil can be increased by about 25%. This will also help in increasing the capacity of the extracting machine.

The main difficulty in crushing the kernel in ghani is its slipping nature, kernel being very soft. This can be overcome by finding out suitable alternative device. Screw press may be suggested as one of them.

Decortication :

Decortication of the seeds can be done by a double roll mill with a hand drive. Even a stone grinder (Chakki) with adjustment for moving one of the grinder stone can also be conveniently used. The husk of these decorticated seeds is then blown off by air and removed.

Oil :

The oil of the seed is of pale yellow colour. When crushed with the husk it gives slightly darker oil without any objectionable odour. The oil is siightly viscous but this viscosity is less than that of castor oil.

† **Characteristics**:

Specific gravity @ 30c/30c	...	0·9173
Refractive Index @ 40c	...	1·4650
Saponification value	...	203·0000
Iodine value (wiz's)	...	106·2
Acid value	...	11·3
Acetyl value	...	30·9
Unsaponifiable matter	...	0·85

* From experimental data worked out at Satyaniketan (Rajur) Dt. Ahmednagar.

† The Journal & Proceedings, Oil Technologists' Association, India. Vol. 7-1951

Fatty Acid Composition :

Caproic acid	...	1·49 %
Lauric acid	...	8·93 %
Myristic acid	...	5·21 %
Palmitic acid	...	4·33 %
Stearic acid	...	1·86 %
Palmitoleic acid	...	13·71 %
Oleic acid	...	16·66 %
Linoleic acid	...	26·11 %
Linolenic acid	...	8·018 %
Ricinoleic acid	...	12·9 %
Unsaponifiable matter	...	0·79 %

Total saturated 19·82.

Total Unsaturated 77·39

It can be very well seen from the above characteristics and composition that the oil is pale in colour and can conveniently be used in soap industry. The oil contains about 20% saturated fatty acids out of which about ~~90%~~ is Lauric acid. It also has unsaturated acids like the Linoleic acid, which gives extra detergent property. The presence of Ricinoleic acid may help in giving lustre to the soap. From the above it can be concluded that about 30% of this can conveniently be used in soap making without any bad effect on the product. The presence of Rauric acid in the oil may also help in reducing the quantity of coconut oil for which suitable substitutes in large quantity are not available.

From the above information it can be concluded that an earnest attempt should be made to survey the availability of this oil seed and its utilisation. The difficulty in its extraction should also be removed by finding a suitable method for extraction.

UNDI (Calophyllum inophyllum.)

Paper II

By Shri. R. N. Naik,

Supervisor–cum-chemist, Kumta Group Multi–Purpose Co- Operative Society, Kumta.

1. Occurence :

Undi is a beautiful evergreen tree found in the eastern and western coastal lines of India and in the interior parts of West Bengal. We see the trees growing near the sea-shore on the sandy places, along the river banks, near the water resources, and in the gardens.

2. Life-Cycle :

When the tree is ten years old it begins to flower. At the age of twenty it yields a good crop. For about forty years more it gives good quantity of fruits. The life of the tree is about 100 years. The tree grows to a height of 25 to 30 feet with many branches all around it, and flowers twice in a year–in January or February, and in June or July. The fruits mature at the end of April or in May and in October or November.

3. Undi Flower :

Undi flower is brownish yellow in colour and is rich in essence and honey, which can be extracted from the flowers. Women use the flowers to decorate their heads.

4. Undi Fruit :

The Undi fruits are green and round, and turn yellow when matured. The diameter of the fruit is abour 3/4 of an inch, with four compartments inside. It is made up of pulp, hard seed coat, soft seed coat and kernel which is about half an inch in diameter.

5. Undi Oil :

Undi oil is bluish yellow when it is freshly extracted in the ghani. Oil extracted by boiling the powdered kernels in water is bluish green. The ghani oil also changes to bluish green as time elapses, due to change in the fine pigments of Undi kernels present in the oil.

6. Collection of seeds :

When the fruits are ripened they fall down. As the seeds are big in size they can be collected by picking one by one. If there is no fear for the seeds to be washed away by the water, seeds may even be collected a bit late. Even if the fruits are left for one month in the water the fruits are not spoiled. Only the outer cover is washed away by water. If we collect the wet seeds and store them, the seeds are spoiled due to the heat produced. So before storing the seeds they must be well dried. We can also store the dried kernels. The trees are given to contractors. They collect the seeds and the seeds–mostly kernels–are brought out in the market. Big trees yield up to 25 B. Mds. of dried fruits per year. On an average we can have 5 B. Mds. of fruits per year per tree.

7. Crushing :

The kernels are very rich in oil content. Dried kernels yield 75% oil. In ghani we get 63% oil. The cake of Undi seeds, preferably in the powdered form is used as a manure.

8. Refining of Undi Oil :

Undi oil is refined in three steps.

First Step :-Crude Undi oil is poured in a big narrow drum. To refine 100 lbs. of oil which contains about 8% free fatty acid and small particles of Undi-Kernels, the temperature of the Undi oil int he drum is raised to about 45°C and a calculated quantity of caustic soda to saponify 8% of the oil is added. Before addition the solution of caustic is diluted to 12° Be. The oil is vigorously stirred and the caustic lye is poured gradually. This temperature is maintained for about 20 minutes and then raised. 25% water is added to the drum and the mixture is boiled for an hour. After adding 5 lbs. of salt to the solution it is again boiled for half an hour and allowed to settle for one day.

We find four layers in the settled oil. At the bottom of the drum we find the mud of the Undi Oil and other heavy particles. The second layer consists of brine water which contains gummy matter and other impurities.

The third one is the soap stock formed by the free fatty acids, which can be used to prepare low quality soap. The fourth layer is the clear brownish yellow oil. This oil has got the original Undi Oil smell.

Second Step:– Refined Undi oil is again poured in another drum. Water is added to the drum and boiled for half an hour. It is then allowed to cool for a while. Calculated quantity of Caustic of 15° Be., required to saponify 3% of the oil is added little by little while vigorous stirring is done. Again salt is added, boiled and allowed to settle. We get here three layers : (1) Brine Water, (2) Soap, (3) Refined Oil. In this stage smell of the oil is reduced and the colour is changed to yellow.

Third Step:-The second step is repeated. But Caustic is used to saponify only 2% of the oil. Practically the oil has lost all its original odour. Colour of the refined oil is yellow.

Uses :

(1) Mainly for burning purposes in villages.
(2) As a massage for rheumatic patients.
(3) Being antiseptic in character it is used in ointments for wounds.
(4) The oil is painted to boats and wooden contrivances.
(5) Undi Oil is used in soap making. Best quality of toilet soap can be prepared by using Undi Oil.

Use of Undi oil in Soap :

If the crude undi oil is used in the manufacture of soap the soap prepared is dark

brown. Undi oil is not directly used in the pan to prepare soap. It is first turned into grained soap which becomes odourless. Soap prepared out of once refined oil becomes yellow when fresh and changes to brownish yellow as time passes. With second and third refinings of oil the colour of the soap obtained changes slightly in the former case and does not change at all in the latter case even with the passage of time.

By placing the refined oil (first stage) in the pan for eight days, the soap prepared does not change its colour. Soap out of Undi oil is soft. This oil can be used upto 50% in soap making.

Three Non-Edible Oilseeds Useful for small scale industry

Paper III

By K. K. Dole, M.Sc., Ph. D.,
Professor of Chemistry, Fergusson College, Poona.

Three oilseeds are being investigated at the Chemistry Laboratory of the Fergusson College, Poona. They are :

1. Argemonne mexicana,
2. Xanthium strumarium.
3. Citrulus vulgaris.

The first two seeds are available in sufficiently large quantities and at present are commodities of no value. Both occur as weeds of resistent type and grow wild. If necessary they can be produced as annual crops and the yield per acre would be quite substantial. The third oilseed occurs in the fruit commonly called water melon and is available as a waste material after the fruit is consumed The following table summarises the chief characterstics of the oils and their fatty acid composition.

Name of the oil-seed	Argemonne mexicana	Xanthium strumarium	Citrulus vulgaris
Specific gravity	0·922	0·925	0·929
Saponification value	192·7	196·200	196·3
Acid value.	21·6	0·95	5·2
Iodine value.	110·123	139·142	116·124
Refractive Index 40°C	—	1·4696	1·4689
Unsaponifiable matter	0·3%	1·2%	0·3%
Fatty acid composition.			
Stearic	8·0 %	7·0 %	7·6 %
Palmitic	6·0 %	1·0 %	6·1 %
Oleic	21·0 %	27·0 %	35·3 %
Linoleic	48·0 %	65·0 %	8·6 %
Other acids	16·2 %	—	3·4 %

Argemonne mexicana is a widely distributed plant all over India The oil is used at present for burning and medical purposes. The yield (present) of oil is 36·5% Taking into consideration the characteristic values it is possible to use it for lubrication, alkyds and cutting oils.

Xanthium strumarium is also widely distributed all over India and its yield per acre is 400 lbs. of seeds. The percentage of oil in the kernel of the seed is 33·6.

Citrulus vulgaris can be used as an edible oil after refining. It is possible to use it in place of safflower oil in the surface coating industry.

Group D. COLLECTION AND PROCESSING.

Effects of processing of Neem seeds on crushing by Kolhu Ghani

Paper I

By Shri. P. C. OZHA.

Development Officer, Non-Edible Oils & Soap Industry, Khadi & V.I. Commission, Kanpur.

The properly processed neem seed can be stored and pressed in decorticated or undecorticated condition in a Village oil improved Wardha Type Kolhu throughout the year. The oil obtained from the seed has much lower acid value, is much lighter in colour and has less odour than the oils obtained by improperly processed and badly stored neem seed. To prove this, certain attempts were made in the H. B. Technological Institute, Kanpur. The experiments were performed as follows.

About 50 maunds of fresh seed was collected and depulped after soaking in water for four days in a depulper fitted with a stirrer. About two hours treatment of the soaked fruit in a depulper with a speed of 25 R. P. M. approximately of the stirrer, was found sufficient to detach the pulp completely from the shell. The mass was then run out from the bottom and the pulpy matter washed off with water. The depulped nuts were dried in the sun for several days. The bulk of the seeds was preserved for further experiments.

Storage experiments on Neem seed :

The following samples were kept in storage for trials.

(1) Whole fruit (Sun dried)
(2) Undecorticated nuts (Sun dried)
(3) Decorticated nuts („)
(4) Depulped nuts specially obtained through a firm at Rae Bareilly.
(5) Decorticated Neem kernels obtained from the same firm.

These samples were examined for their moisture content, oil yield in the Wardha improved type Kolhu and the quantity of oil obtained every month. The results obtained are shown as under:-

Sample No. I

From the Kernel of the whole sun dried fruits

Period	Moisture content of kernel	% of oil content of kernel	% Oil yield in Kolhu	A. V.
1	2	3	4	5
On Pressing	5·0	51·8	42·0	7·6
After 1 month	4·0	51·8	42·0	7·6
After 2 months	4·9	51·8	42·0	7·6
After 3 months	4·8	51·7	41·7	7·7
After 4 months	4·8	51·5	41·7	7·7
After 5 months	4·8	51·3	41·4	7·7
After 6 months	4·7	51·2	41·5	7·8
After 7 months	4·7	51·2	41·4	7·8
After 8 months	4·7	51·1	41·4	7·8
After 9 months	No experiment was performed.			
After 10 months	4·7	51·1	41·4	7·8
After 11 months	4·7	51·0	41·4	7·9

II. *From undecorticated nuts.*

1	2	3	4	5
On Pressing	5·1	51·5	42·0	7·7
After 1 month	5·0	51·4	42·0	7·9
After 3 months	4·8	51·5	42·0	8·0
After 4 months	4·9	51·5	41·8	8·0
After 5 months	4·8	51·4	41·6	8·0
After 6 months	4·8	51·4	41·4	8·3

1	2	3	4	5
After 7 months	4·7	51·3	41·2	8·3
After 8 & 9 months	No experiment was performed.			
After 10 months	4·7	51·2	41·1	8·4
After 11 months	4·7	51·1	41·0	8·4

III. *From decorticated nuts (Sun-dried)*

1	2	3	4	5
On Pressing	7·5	52·1	42·1	7·9
After 1 month	7·0	52·4	42·1	7·9
After 2 months	6·5	52·6	41·8	8·0
After 3 months	6·0	52·6	41·6	8·2
After 4 months	6·0	52·6	41·1	8·4
After 5 months	6·0	52·3	41·0	8·6
After 6 months	6·0	52·0	40·6	8·8
After 7 & 8 months	No experiment was performed.			
After 9 months	5·9	51·1	40·0	9·0
After 10 months	6·1	51·1	39·8	9·6
After 11 months	6·2	51·1	30·6	9·6

IV. *From depulped nuts specially obtained from Rae Bareilly*

1	2	3	4	5
On Pressing	18·2	40·0	35·1	12·0
After 1 month	13·1	43·8	36·0	18·1
After 2 months	10·2	44·0	35·6	25·0
After 3 months	8·1	48·5	27·8	31.0
After 4 months	6·0	46·0	20·2	38·3
After 5 months	4·8	48·1	Cake did not set.	
After 6 months	4·3	48·2	,, ,, ,,	
After 7 months	4·3	48·0	,, ,, ,,	

V. *From kernel obtained from Rae Bareilly*

1	2	3	4	5
On Pressing	15·6	43·0	35·5	15·0
After 1 month	11·2	44·1	33·0	24·3
After 2 months	7·0	45·6	25·1	31·9
After 3 months	6·1	46·8	15·0	40·1
After 4 months	4·3	47·5	Cake did not set.	
After 5 months	4·3	47·0	—do— ,, ,,	
After 6 months	4·3	46·8	,, ,, ,,	
After 7 months	4·2	46·6	,, ,, ,,	

The results indicate that as regards the keeping properties of seeds prepared by different methods, the one prepared by properly drying the whole fruit has best keeping properties. This seed does not undergo deterioration even after one year's storage. Next in order of this property are the undecorticated nuts obtained after properly depulping of fruit and drying of nuts. Third in order are the kernels obtained by properly depulping the fruit, drying and decorticating the nuts. These kernels also did not undergo any deterioration during storage for about a year.

Quite contrary were the results with commercial seeds obtained from Rae-Bareilly market. The undecorticated nuts from the market began to deteriorate even in the third month and the apparent increase in oil content as obtained by solvent extraction in the soxhlet was evidently due to drying up of the seed and loss of moisture. In the fourth month the seed became darker in in appearance apparently due to heating up of the seed by auto-oxidation and the texture of the seed deteriorated so as to bring down the oil yield as in the case of pressing by Kolhu. Further deterioration was observed in the fifth month in the appearance of the seed and the oil yield. In the sixth month the seed became almost black and when tried to be crushed in Kolhu the cake did not set and crushing could not be done successfully.

In case of kernels decorticated on a commercial scale in the market, the deterioration

was even more rapid, as, in the third month itself the yield of oil fell appreciably and in the fourth month not even half of the oil was available by pressing in the Kolhu. In the fifth month no oil could be pressed from this seed in the Kolhu as the cake did not set at all. The seed grew darker and darker in colour and had almost a charred appearance in the sixth month.

Conclusions :

(1) Neem seed stored by our centres at present is prepared by crude unscientific methods due to which the seed during storage heats up and due to auto-oxidation yields an oil very dark in colour, of high acid value and of a pronounced unpleasant odour. On account of these defects the texture of the seed deteriorates making it difficult to allow crushing in the Kolhu. In course of time this deterioration may proceed to such an extent that little oil can be pressed from it even in hand screw presses.

(2) By proper processing of the fruit consisting of three operations of (i) depulping, (ii) drying and (iii) decortication, it is possible to produce neem seed which can be stored throughout the year and which produces an oil with much less free fatty acids, much lighter colour, and less odour. By adopting this process a large potential source of oil can be opened.

NEEM SEED COLLECTION

Paper II

By K. G. Shimpi,

Supervisor-cum-Chemist, Bombay Village Industries Board.

Before starting a Non-edible oil soap centre the area in a radius of 20 miles should be surveyed for the following :—

(1) Availability of Non-edible oilseeds.
(2) Geographical conditions.
(3) Average rainfall.
(4) Approach roads.
(5) Transport facilities.
(6) Nearest oilseed markets etc.

In case of 'A', 'B' and 'C' class composite units using Neem oil, there should be approximately, 50,000, 20,000 and 7000 neem trees respectively in the adjoining areas. It is needless to say that before starting the seed collection, cost of the following should be well estimated.

(a) Quantity of Neem seeds required.
(b) Wages to be paid to the collectors.
(c) Transport charges.
(d) Gunny bags required.
(e) Storing arrangements.
(f) A platform with shed to dry the wet Neem seeds.

A 'C' class soap centre with production target of 8 tons of soap per annum requires 75 B. Mds. of Neem oil (if used 50%). 'B' class and 'A' class soap centres with production targets (soap) of 15 tons and 30 tons of soap per annum require about 150 Mds. and 300 Mds. and of Neem oil per annum.

Seed Collection Programme for a 'C' Class centre :—

As said already a 'C' class centre requires 75 Mds. of Neem oil. To be on the safer side about 1200 Mds. of Neem seeds may be estimated. Generally the season for Neem seed collection starts from the third week of May and ends by the middle of August i.e. the maximum duration of the season is 3 months. A person in charge of seed collection should be appointed at least a month earlier. Propaganda should be done by

distribuing hand-bills and contacting Social Workers in village sroundabout. Village shop-keepers are of great use in seed collection. If they are given a fixed commission per maund, the shop–keepers can purchase the seeds in exchange of the daily needs of the villagers, so that working capital of the centres will not be blocked. The Neem seeds collected in various collection centres should be then transported to the shop centre. It is not necessary to use gunny bags if transported by trucks.

Drying, decorticating and crushing :

The Neem seeds brought from outside are wet due to rains . To avoid decomposition and damping, the seeds should be carefully dried on a platform under a shed. This drying may last for about 2 months.

Decortication is generally started in the month of October. By means of bullock-driven Chakki (Decorticator) three women can decorticate and clean about 10 Mds. of Neem seeds in a day. The decortication charges are estimated as follows :—

Rs. 1·87	Wages paid to the women.
Rs. 0·13	Depreciation of Chakki.
Rs. 2·00	Bullock charrges
Total Rs. 4·00	

This means that Rs. 4 are required to get 10 maunds of Neem seeds decorticated. After decortication kernels should be properly cleaned before being crushed. About five charges of 10 seers can be taken by one ghani in a day (8 hrs.) For crushing 1 Md. and 10 seers of kernel the following expenditure is incurred :—

1. Wages to Teli Rs. 1·25 @ Re. 0·25 per charge.
2. Bullock charges Rs. 2% per day.

From 1200 Mds. of seeds about 390 Mds. of kernel are obtained, which can be crushed by the two ghanis in six months. On the basis of the above discussion the following expenditure can be estimated :–

1.	Seed collection (wages to collectors @ Rs. 1.25 per Md. for 1200 Mds. of Neem seed.	Rs. 1500
2.	500 Gunny bags (@ Re. 1/- per bag- cost taken is 25% as bags can be used for 4 years)	Rs. 125
3.	Transport charges (@ an average of Rs. 0·50 nP per Md. for 1200 Mds. of seed)	Rs. 600
4.	Commission to agents (@ Rs. 1.15 nP. per B. Md.)	Rs. 180
5.	Propaganda (handbills)	Rs. 100
6.	Salary of person in charge of seed collection (@ Rs. 60 per month for 4 months)	Rs. 240
7.	Decortication charges @ Rs. 4/- for 10 Mds. of seed	Rs. 480
8.	Crushing charges	Rs. 1014
9.	Miscellaneous	Rs. 100
	Total	4349

From 350 Mds. of kernels, about 100 Mds. of Neem oil and 290 Mds. of Neem cake will be obtained. If the market price of one maund of Neem oil is assumed to be Rs. 40/-, total sale proceeds of the Neem oil obtainable will be Rs. 4000/-. The Neem cake is being sold at the rate of Rs. 4/- per Md. (which is certainly low). The total sales–proceeds obtainable for Neem cake at this rate is Rs. 1160/-. Total sale-proceeds obtainable for Neem Oil and Neem cake will be Rs. 5160/-. That is according to this there will be a net profit of Rs. 821/- upto the stage of soap production.

Collection, Storage and Extraction of Non-edible Oil Seeds.

Abstrct of Paper

Paper III

By Shri. Kantilal Patel,

Supervisor-cum-chemist, Non-edible Oils and Soap Industry, Khadi and V. I. Commission, Malerkotla.

Though India has been producing and using many non-edible oilseeds since time immemorial, their use has been limited even to the present day mainly due to inefficient methods of collection. Thus we should see how collection can be organised to give best results. Accordingly the following suggestions are made :—

1. Sites selected for seed collection should be in the vicinity of the production centre.

2. Collection should be done during the proper season and full advantage should be taken of it by speedy collection. Local workers should be encouraged to collect seeds by means of distributing pamphlets.

3. The Collectors are handicapped in drying the seeds in their houses. Therefore, seeds should be purchased from them daily, so that the seeds can be properly processed at the Centre and at the same time the Collectors will remain satisfied due to to prompt payment of wages. If necessary Mukadams may be appointed who should be responsible to supervise collection. Advances may be made to these Mukadams for payment of wages etc. to the Collectors.

4. The work of the Collectors should be strictly appreciated, irrespective of the quantity collected. As an incentive to pursue this work, a scheme for giving prizes should be formulated.

5. Godowns for storage of seeds should be well-ventilated. The seed collected should not be stacked in one big heap but piled in small heaps, so that the wet seeds would not decompose in the absence of sunshine. These heaps should be turned from time to time so that all layers in the heap would be open to sunshine. Similarly, the seeds should be passed through a sieve before storing and all stones and rubbish removed.

6. Decortieation and oil extraction becomes easy once the above precautions are taken. The main care to be taken is to see that the seed does not decompose till the drying stage. Decomposed seed gives bad quality of oil. However, besides this, the present problem of crushing is that during winter most of the oilseeds cannot be crushed, as the oil cells do not get released easily. It has to be thought over whether some other method of crushing can be adopted.

Non-Edible Oils and Oil Cakes

Group A: OIL EXTRACTION BY BULLOCK-DRIVEN GHANIS

Abstract of the Paper read by

Paper 1

Shri. B. S. MURTHY,

Supervisor-cum-Chemist, Non-edible Oils & Soap Industry & Khadi, Village Industries Commission, Cuttack.

The system of crushing by ghanis which has been known to India from remote ages owes its survival to-day probably due to the low prime cost, negligible maintenance expenditure and extremely low labour charges required for its maintenance. Several attempts have been made to improve the ghani technique, but the stage of standardization has not reached perfection.

The main functions of a crushing device are the pressure and heat it is able to effect to expel the oil from the seed. Whereas ghani crushing does not give an optimum yield, the heat generated in the mill-crushing process is so high that the oil loses many of its important characteristics. The rotary ghani has been able to remove the above two shortcomings at the same time being simple to operate at a low cost. This ghani consists of a mortar and pestle made of iron which rotate in opposite directions, thus quickening the release of oil. In case of non-edible oils, a larger yield is obtained by heating the crushed seed in a steam-jacketed pan to about 160°-180° F., and by blowing steam through the meal. Taking into consideration the advantages of the rotary ghani or any other accessory over the bullock-driven ghani, improvements are necessary in the latter. As far as the sanctions by the Khadi and Village Industries Commission are concerned, the present pressing equipment, (bullock-driven ghani), should be suitably modified so as to be available within the sanctioned amount of Rs. 24,000. This amount is provided for purchase of 12 bullocks, 8 ghanis, 4 chakkis, shed etc. The present mode of crushing requires larger space, greater care for maintenance of bullocks and at the same time cannot be worked throughout the year. Hence, the entire scheme for oil-pressing should be reviewed and better and efficient methods substituted.

Paper II

By Shri S. N. CHAUBE,

Development Officer, Non-Edible Oils and Soap Industry, Khadi and Village Industries Commission, JAIPUR

As per programme of the Khadi and Village Industries Commission the Scheme of Non-edible Oils and Soap Industry aims at the utilisation of maximum amount of ne-oils for industrial purposes. If this is our programme, it should be our effort to adopt efficient methods of oil extraction so as to effect extraction of maximum quantity of oil.

Most of the ne-oilseeds are available for collection when the monsoon sets in and in almost every part of the country there are heavy rains, thus creating a great difficulty in collection of ne-oilseeds, especially for the unequipped labourer. Under the circumstances, with all the precautions on his part, the labourer cannot save the seeds from deteriorating and when these seeds are crushed in ghanis numerous difficulties creep in, i. e. the seeds do not form cake and become powder. Often they do not yield any oil when crushed during winter as a result of which we have to wait for the next summer; by this lapse of time the percentage of oil in the seed decreases. Besides the above it is a well-recognized fact that yield of oil by ghanis is 5-10% less in comparison to that by expellers.

Taking in view all the above considerations it seems advisable to get the non-edible oil seeds crushed in expellers. By so doing the centres are relieved of the burden of maintaining bullocks at the same time increasing the amount of oil crushed. In any case, it is not possible to run the ghanis for the whole year. At the most the ghanis can be run for six months. Maintenance of the bullocks for the next six months becomes an investment without income. When we talk of getting the non-edible oilseeds crushed in expellers, naturally we ignore this aspect of the Commission's scheme. Thus, before adopting any such schemes we should think over with a cool mind and evolve a method with due study. The common and suitable appliances which are being used for the extraction of oil that I have come across are the Hand Screw Press, and the Chappa.

The first one is being extensively used in Bihar for the extraction of castor seed oil and so this is also called "Andi Kal". Mohwa seed is also being crushed by this method but its advantages are yet to be studied. The Chappa is a big piece of straight wood 11" long and about 18". in diameter, split in two parts diametrically. A platfrom is prepared in the middle of this wood so that the meal of the seed is put on this platform in filter cloth bags of rugs. The working of this Chappa more or less, is on the same principle as that of an Anglo-American Press. Both these appliances attract me for the simple reason that in the first, while crushing the oilseeds fire is burning all the time in front of this press so as to effect the extraction of oil easily; similarly in chappa the meal of the seed is heated with the help of steam and thus we can make use of this method for extraction of oil in winter also. The price of the first one is about Rs. 3,000. However, smaller machines on similar principles can be devised for being introduced in our centres.

MOHWA SEED CRUSHING BY GHANI DURING WINTER

Paper III

By Shri. P. C. Ozha,
Non-Edible Oils & Soap Industry, Khadi & Village Industries Commission, Kanpur.

Barring a few areas, Mohwa trees grow in almost all parts of India. Though its seed is being utilised since many centuries, even today its use is limited and lakhs of maunds of Mohwa seed goes waste. The use of Mohwa flowers had been known since ancient times. Mention of Mohwa liquor is made even in the Vedas. Prior to the 20th Century Mohwa oil was used for lighting purposes to a considerable extent, its other uses being for edible purposes (both for human and cattle), as lubricant to agricultural implements, for applying to water skins and wooden appliances.

The age-old crushing methods viz. by ghani and crushing in between two wooden planks, have now been outstripped by modern machinery. The present oil crushing contrivances in India are the Hand screw Press, Anglo-American Hydraulic Press, Cage Press, the Expeller and the Solvent Extraction Plant, which can crush Mohwa seed throughout the year.

The yield of any seed depends upon four factors viz. :

(i) Condition of the seed, whether it is fresh or decomposed.

(ii) Condition of the meal, whether it consists of fine particles or otherwise.

(iii) Melting point, whether it is high or low, and

(iv) oil content.

In the first case, the decomposed seed loses its cohesion due to disintegration of albuminous matter and when crushed by the machine it does not give out any oil at all. Sometimes a very negligible percentage of oil can be recovered, even though the oil content is high in the seed, as is the case with the decomposed Neem seeds.

Secondly, the meal particles should be fine so as to yield maximum oil. Bigger particles cannot be pressed easily and as a result of this a greater percentage of oil is left in the cake.

Thirdly, oils having high melting point present difficulties while crushing in ghani during winter when the oil gets solidified. Hence, steaming of the seed meal always helps in giving optimum moisture for easy crushing which helps in coagulation of oil particles and easy rupture of cell walls.

The fourth point is as regards the oil content in the seed. If the oil content is high, the pressing contrivance is not able to exert proper pressure on the seed meal because of its slipping tendency. In such a case, a lot of oil is likely be left untapped.

The large scale crushing appliances are manufactured taking into consideration the above four aspects so that according to peculiarities of seeds, seed meal, etc., the machine can be adjusted.

Ghanis versus Mills:-

From the view point of working, the following are the main differences between ghanis and mills:-

1. While all types of seeds can be crushed in mills throughout the year, ghanis cannot crush oils, especially Mohwa, Khakhan and Copra during winter.
2. Oil percentage left in oil-cake is more in case of ghanis.
3. Production by ghanis is less within a given period compared to that by mills.

4. Investment in mills is enormous compared to that required for ghani installation.
5. The breakages and repairs are few in ghanis and can be attended to within a shorter period compared to the Mills.
6. Ghanis can be transferred from one place to another very easily.
7. Employment potential is more in case of ghanis.
8. Ghani (edible) oil is superior to mill crushed oil from nutritional point of view.

In the interests of the Industry, it is necessary to see that the efficiency of the existing ghanis is increased. Or, any alternative device evolved and introduced, at the same time adhering to the Khadi & Village Industries Commission's policy, viz., that of non-utilization of power and creating maximum employment opportunities.

Hand Operated Machines : Hand Screw Press

In this press there are iron plates side by side joined by a shaft which can be moved forward and backward. The oil meal is placed in between these two plates. By means of screws at both ends (pressed one at a time) oil is extracted. The capacity of the press depends upon the number of plates and the hand pressure. At the rate of 1½ Md. per charge about 10 charges can be taken in 12 hours by this press. Usually about 9 to 10 p. c. of oil remains in the cake. In case of castor cake, this percentage is 6 to 7. Including persons employed to grind the seed (2 persons) and to operate the press (4 persons) the total number required for this press is six. Usually these persons are employed on a contract basis.

Similar to the above press, there is another type of presses in which in between the iron plates, the seed meal is placed in a woollen cloth instead of the filter cloth as is in the former case.

This hand operated press can be employed for Mohwa crushing throughout the year. But it is more intricate and difficult to operate. Another disadvantage is that its capacity is the same as that of ghani though investment is higher. Thus it is better to improve the ghani so as to enable its working in the winter season also. Accordingly, the following suggestions are made :—

(1) While crushing Mohwa seed hot water should be circulated in the mortar of the ghani so as to maintain the temperature between 45° to 50° Centigrade as the melting point of Mohwa oil is not above 40° Centigrade.

(2) In order to maintain this temperature by circulation of water the mortar should be of cast iron or both the mortar and the body should be made of iron with arrangements for circulating hot water in between these two. Because of this there is likely to be more wear and tear of the wooden pestle. However, this may not cause any considerable damage.

(3) Only those ghanis which are meant for Mohwa crushing in winter may be converted into the above type of ghanis.

(4) At certain places, especially in Bihar, Mohwa Oil is extracted by means of pressing heated Mohwa meal in between two wooden planks. At present this is operated by tying a rope round the two wooden strips. This method can be improved by fixing screws and lever to the planks. At present, in eight hours one man can grind, apply steam and crush one maund of Mohwa seed. I think it would be possible to crush Mohwa oil by this method during winter also.

ADVANCES FOR NON-EDIBLE OIL INDUSTRY

Paper IV

By Shri. R. F. MANE

Supervisor-cum-Chemist. Ne-Oils & Soap Industry, Khadi & Village Industries Commission, Bombay.

Among vegetable oil-seeds each country has its own variety of oilseeds. Besides the commonly known oil-seeds there are many non-edible oil-seeds available in India which can be used for industrial purposes with advantage. For example, the Pisa seed fat available in India contains pure tri-laurin which is perhaps rarely found in other parts of the world. The superiority of acid soap over other fatty acid soap as regards detergency, hardness and solubility in water is concerned, is well-known and if this seed fat is made available in large quantities, it may entirely replace the coconut oil in soap manufacture. Like Pisa, kamala, cashew shell, khakan and undi oils there are so many other non-edible oils which may be most useful for industrial purposes.

The present modes of crushing in India are three, namely ghanis, expellers and solvent extraction plants. Though the bullock-driven ghani gives the maximum employment and is the best decentralized tool, it has certain drawbacks with respect to crushing of some non-edible oil-seeds. By this method greater percentage of the oil is left in the cake which is not advisable, since it is a waste of oil; the cake produced is also not useful for manurial purposes. Solvent extraction plants which have been advocated for extraction of oil remnants of the cake are very few in India, as solvents required are to be imported. The cake breaker in this device influences the degree of extraction greatly. But it cannot be devised on a village scale. This method works most efficiently and economically when the oil content of cake is between 15-20 per cent and when the solvent loss is not more than 1% and the plant has a minimum turnover capacity of 50 tons per day.

To instal a plant of 50 tons, investment to the tune of Rs. 23 lakhs and more is required. Obviously, this investment cannot be acceptable for our village industry scheme. On the other hand, some other suitable method like expellers run by bullocks could be devised.

2. Recovery of Glycerine :

In India very few soap factories recover the valuable by-product namely, glycerine from spent lye. The large scale sector contributes only about 50 to 60 thousand tons of soap, the rest is produced by small scale industry units which cannot recover the glycerine on an economic basis. Up till now these small factories have never come together and formed an All India Organisation for implementing the scheme of recovering glycerine on a large and economic basis. In our case we have formed an Association which can undertake such schemes. For recovery of glycerine there are some methods which require huge plants and high technical supervision. In my opinion, the method most suitable for us is *Refining of Glycerine by Ion Exchange.*

Even though the phenomenon of Ion-Exchange was known to the chemist of the last century, substantial progress has been possible only after discovery of Adems' and Holmes' synthetic cation and anion exchange resins. Schwarts incorporated a reolite in his process to exchange for sodium salt after lime treatment and precipitation. The purification of glycerol by ion exchange involves passing a solution either of the

spent lye or crude glycerol through successive beds of regenerated cation and anion exchange resins, so that the ionised solids e. g. sodium chloride, free fatty acid, organic acid and colour etc., are removed and glycerol of 98% purity in the form of acqueous solution is obtained. This can be regenerated by hydrochloric acid or sulphuric acid without any heat treatment. For this process the following conditions should be met :—

(1) The solution must be quite dilute and of a low viscosity (total solid below 35%).

(2) This solution must be relatively free from the fats and oils as these are found to foul the exchange beds.

(3) Less turbidity should be present in the solution.

(4) Temperature should be low—95°F.

The economics in the process of purification of glycerine by ion-exchange depend mainly upon the cost of chemicals needed for regeneration, cost of evaporation, and percentage of glycerol and salt in crude form recovered. It was found that for 80-81% of glycerine and 5-9% of salt the cost of regeneration would be 0.7 to 1.0 anna per lb. of 99% glycerine.

The concentrated glycerol produced by Ion-Exchange followed by evaporation is equal to and in most cases superior to distilled glycerol. Glycerol obtained by ion-exchange treatment generally has less ash, colour and fatty acids. The installation cost for it may come to Rs. 25,000 to Rs. 30,000. For every 25-30 Centres we can locate such a type of unit at a central place, where electricity etc., are available. This requires very little technical assistance and is easy to handle. The recovery of this valuable by-product will be surely helpful in making the position of the centres sound, besides providing more employment opportunities.

3. Phenyl, Varnish and Paint Industries :

Paint and Varnish industry whose present capital investment is about 2.7 crores has tremendous scope in India. Indian consumption of paints and the other coating compositions is valued at Rs. 6-7 crores. Though Linseed oil is the main drying oil used in the production of various coating compositions, the Tung, Kamala and Cashew nut shell oils are also good raw materials for this industry. Cashew shell oil, though available in considerable quantities along the coastal regions, is not used locally but is mostly exported to U. S. A. The resins of cashew and Bhilawa have shown good results in enamels, varnishes and water proofing material, moulding powders, and postal stamps and allied industries. Oils similar to Linseed oil (non-conjugated, linoleic and linolenic) dry relatively rapidly and give films of varying but considerable rigidity and toughness. Increasing contents of linolenic glycerides nevertheless confer the undesirable property of developing yellowness in the paint films, especially when the fatty acids of oils of this group are incorporated in alkyd resins. Consequently, the second group of drying oils, with high content of *linoleic glycerides and negible amount of linolenic glycerides* are commanding increasing attention. Too much dependence on few drying oils, practically only linseed oil, has hitherto characterised the paint industry. It is, therefore, quite essential to conduct research and investigation to utilize other non-edible oils and our industry can contribute a lot in this regard for the benefit of the centres. As compared to paint manufacturing, varnish requires less technical assistance and is easy to be be introduced at our centres.

Varnishes are designed to produce a richly glazed finish and consist essentially of one or more gum-resins dissolved in a mixture of a drying oil and a thinner.

Some coluring matter may also be present but its function is subordinate. The old fashioned varnishes which are still in great favour with decorators contain one or a mixture of certain fossil resins which become thoroughly hard and stable through age-long exposure. They are, however, not mixable with fatty oils until after a preliminary heat or stabilisation treatment. Rosin is heated at about 300°C for some hours to form a liquid, is cooled somewhat and about 25-30% of its weight of boiled oil is cautiously added and the whole heated up again as before for about an hour. The product is then soluble in boiled oil. This process is possible on a village level. No special apparatus is required for this. The *kadhai* can be used for varnish making and is convenient also for raising the temperature of the mass upto 300°C as it has the maximum surface area to radiate heat and less convection trouble.

India produces only very small quantities of mineral oils and has to import her requirements for lubricating oils. Many vegetable oils can be used for various types of lubricants after suitable modifications. Moreover, the major components of lubricating greases are the metallic salts of various fatty acids. Vegetable lubricating oils and grease industry, therefore, has great prospects. The modern jet planes entirely depend upon castor oil from which multi-purpose lithium greases are made. Some of our ne-oils are capable to replace the petroleum. Some are equally good in diesel engines but give more smoke and danger of being oxidised.

Besides the above, there are other industries where oils and fats are used as raw materials to varying extent, such as textile, rubber, tyres, ointments, leather articles, printing inks, etc. These industries require high technical guidance and are not possible to be introduced on village level in the near future.

Systematic chemical investigation on Neem and allied inedible medicinal oils and their utilisation

Paper V

By Dr. C. R. Mitra,
National Chemical Laboratory, Poona.

The non-fatty constituents of disagreeable odour and taste present in the so called inedible seed fats render them unsuitable for any industrial use. A number of such seed or nut fats viz. Neem, Karanja, Punnal, Nageswar, are available in plenty throughout the country, but, due to lack of any organised collection of these seeds and nuts and their proper utilisation, their potential availability cannot be properly estimated. The agricultural data published from time to time indicate it to be worth a few million rupees.

With a view to have a proper industrial utilisation of these resources a systematic chemical investigation in both the non-fatty constituents as well as the fat after purification and refining has been carried out under the Council of Scientific and Industrial Research as a long range programme of research and it has been found that the non-fatty medicinal constituents can be extracted from the oils with alcohol in cold. The fats freed of the non-glyceridic constituents can be easily processed even to edible quality.

This process thus ensures proper utilisation of these hithertofore wasted raw materials.

The results of the investigations with the non-fatty constituents of these fats, show that these constituents belong to different groups of chemical entities. A thorough study in their chemistry and medical properties based on modern methods, establishes uses for these constituents. It may be mentioned here that certain specific medicinal use has recently been established for the major bitter constituent of Neem oil. Utilisation of the non-fatty constituents in the pharmaceutical industry would not only contribute towards development of new therapeutic agents and thus to the fuller use of these resources but will also reduce the cost of the processed fats. The chemical investigations with the refined and purified fats mentioned earlier have shown that there is no peculiar fatty acid in these so called medicinal oils to which therapeutic value can be attributed, and their glycerides are composed of common fatty acids.

The process for industrial utilisation of these fats are now being worked out on pilot plant scale in the National Chemical Laboratory, Poona, in collaboration with the Industry.

Group B: DISPOSAL OF NON-EDIBLE OIL CAKE

Paper I

By Shri S. B. Shah,

Supervisor-cum-Chemist, Ne-Oils and Soap Industry, Khadi and Village Industries Commission, Bombay.

Generally when most of the non-edible oil centres, not accustomed to crushing non-edible oil seeds, see heaps of oil cakes, get desperate, as practically from each variety of non-edible oil seed they crush, they get 60 to 70% of the cake. Many centres, which do not know the value and proper use of the non-edible oil cakes, sell them off at very negligible rates or burn them as fuel, with the result that the cost of oil production is increased ultimately making the price of soap costlier. To easen this situation it is necessary to find out the oil cakes which would be suitable as manures.

Oil cakes should be given first preference for cattle feeding by the agriculturists and cultivators. Only those cakes which cannot be used for cattle feeding purposes should be supplied to the soil. Since most of the non-edible oil cakes contain poisonous substances, they cannot be used as cattle feed. It should, therefore, be our effort to find out suitable and efficient processes by which the poisonous substances are completely eradicated from the non-edible oil cakes, whereby a large stock of detoxicated oil cakes could be available as cattle feed. Mohwa cakes contain the poisonous substances 'mowrin', castor cakes contain the nitrogenous substance 'ricin' and likewise Neem and Karanja etc. also contain such substances. It is possible to detoxicate these substances by heat treatment or chemical treatment, thus making them useful as cattle feed.

Nutritive value of cotton seed cake:

A great deal of experimental work is being done on the nutritive qualities of cotton seed oil cake, at the oil technological institutes in India. It is found that this cake

is the cheapest of all from the view point of starch equivalents and digestible proteins. This oil cake is also rich in phosphorous and vitamin B. Cotton seed oil cake suitably mixed with hulls, bran and hay is an excellent nutrient to cattle-both dairy and farm—sheep, horses, poultry etc. Cotton seed oil cake, with even 5% of oil, contains enough fat for the cattle. In India cotton seed cake, which is an excellent cattle feed, should replace cotton seed, and thereby save large amount of oil from being wasted which could find use for several industrial purposes.

Linseed cakes :

Though these cakes can be used both as a cattle feed, and as manures, they should preferably be used for the former purpose since the supply of cheap cattle feed is limited.

Manurial value of Non-edible oil cakes :

Although the main occupation of the people in India is agriculture, it is found that use of fertilizers per acre of cultivable land is very low compared to other countries as shown below.

Use of fertilizers per acre of cultivable land during 1955-58 (*in lbs.*)

Country.	Nitrogen Lbs.	Phosphate Lbs.	Potash Lbs.
Netherland	157	95	142
Japan	98	59	67
U. S. A.	10	10	9
India	0.9	0.07	0.05

(*Sunday Standard* 9th Febuary, 1958)

According to the plant Food Savings Department, only 1½ million tons of plant nutrients, i. e., nitrogen, potash and phosphate are deposited annually to the soil by means of manures and fertilizers, while 7½ million tons of plant nutrients are removed from the soil by harvest crops. This shows that the Indian soil is badly in need of plant nutrients. The non-edible oil cakes which can generally be used as manure, could be of much value for this purpose. It is estimated that nearly one lakh tons of plant nutrients can be available from the non-edible oil cakes obtained by pressing the seeds available for crushing. So, even though the addition in plant nutrients is less, it is by no means negligible.

Oil cakes are classified under natural manures, which generally give nitrogen, potash, and phosphates to the soil. Oil cakes which are produced as valuable by-product of the seed crushing industry contribute considerably towards a better and quantitative source of natural manure.

In these days of food shortage and fodder famine, it is not advisable to utilise edible oil-cakes for manurial purposes. The manurial value of oil cakes depends upon the content of nitrogen which is much higher in most of the non-edible oil cakes than in other farm yard manures. Besides this, most of the cakes are fairly rich in phosphate and potash, which under suitable conditions become available to the soil. The primary value of oil cakes as manure is due to release of nitrogen during the process of decomposition. The rate at which the nitrogen is available to the growing plant depends upon many factors, like moisture, temperature, conditions of the soil, sunshine and the quantity and quality of manure added. Oil cakes require a certain amount of water to decompose and the soil acts as a medium. Like other manures, oil-cake cannot be applied to the soil at the sowing time, but should be applied about 2 to 3 weeks earlier.

Neem Cakes :

Nitrogen content is 5.2 %, phosphate is 1.1% and potash 1.4%. Neem cake has a fairly high fertilizing value and is said to have germicidal effect on white ants and does not allow any other germs to eat

away the crop. Hence, it is widely used for the Sugar-cane crops and other important crops. These cakes are sold at the rate of Rs. 9/- per maund in U. P., while the normal rate of edible oil cakes is Rs. 8/- per maund. It, thereby, proves its importance and value.

Karanja Cakes :

Its nitrogen content is 4.4%, phosphate is 0.9%, and potash is 1.3%. When I was in Bihar, I was informed by some of the Karanja Oil Production centres that they could use Karanja cakes as an effective manure for paddy crops. Such experiments should be carried out by our Centres wherever possible.

Castor cakes :

It has got 4.37% of nitrogen, phosphate 1·85% and potash 1·39%. Use of Castor cakes as a manure is known to many cultivators. It decomposes rather slowly. Hence, as compared to other oil cakes, its nitrogen becomes available at a slower rate. Its effect, therefore, is more lasting. It can be used as a good manure for cotton, ground-nut, Jowar, Tobacco, Sugarcane, Wheat, etc.

Mohwa Cakes:

Its nitrogen content is 2·5%, phosphate content 0.8% and potash content is 1.9%. Though Mohwa cake contains slightly less of nitrogen it can be used as a manure, if applied to the soil considerably in advance of the sowing time. It this case, the harmful effect during the process of nitrification which Mohwa cake produces is considerably reduced. Mohwa cake can be utilised as a good manure by mixing it with a nitrogenous fertilizer like sulphate ammonia. It is applied to the soil as a manure for important crops, such as sugar-cane and paddy.

Extraction of oil contained in the non-edible oil cakes :

Generally ghani-pressed oil cakes contain about 12-14% of oil, expeller cakes contain 7-12% and by solvent extraction method the oil content of the cakes is 0.5 to 1.0%. Edible oil cakes, since they are generally fed to the cattle, require certain oil percentage to remain in cakes for giving enough fat to cattle. It is an established fact that the presence of oil in oil-cakes used as fertilizer, prevents the latter from being attacked by such Organisms of the soil which convert the constituents of the fertilizer into immediate soil food and are thus prevented from being absorbed by the soil gradually.

It is desirable to extract oil remaining in the cake by solvent extraction method, thereby reducing the oil percentages in the oil cakes, from 12 to 14% to 0.5 to 1.0%. Though actual data regarding availability of ne-oilseeds for collection is not available it is estimated that total seeds available for collection is roughly 20 million tons per year.

Seeds at present collected for crushing annually.

1,60,00,000	tons of Neem seed	5 %
20,00,000	tons of Mohwa ,,	50 %
1,00,000	tons of Karanja ,,	50 %
19,00,000	tons of other seeds	5 %
2,00,00,000	tons of Ne-oil seeds	

Out of these about 10% i. e. 20,00,000 tons are now collected. The non-edible oil cakes available from these will be nearly 10,00,000 tons.

According to this supposition that a large portion of oil is crushed by mills (by which process about 8 p. c. of oil is left in the cake) the oil saved will be about 80,000 tons annually, by removing the oil remnants by solvent extraction method, which is not a negligible quantity. The

problem before us is whether we can put this method into practice. In my opinion a systematic plan could be prepared. In every state a small solvent extraction plant should be installed and the same may be kept under the control of the regional depots, which will try to collect non-edible oil cakes from the centres, besides their other activities.

There are solvent extraction plants in Bombay State extracting oils from the edible oil cakes. If they can be run economically, I think, it may be possible to apply the solvent extraction method successfully and economically for the non-edible oil cakes. A systematic production and disposal of the non-edible oil cakes, as we have seen, can become indeed the best and the most essential by-industry for the oil-pressing centres.

Disposal of Non-edible Oil Cakes

Paper II

By Dr. K. K. Dole, M.Sc., Ph. D.,
Professor of Chemistry, Furgusson College, Poona.

Utilization of oil-cakes from non-edible oils is always a problem. Its most common utilization being as a fertilizer, though better utilization can be recommended. As far as castor seed is concerned, in our laboratory, methods which can be used even on a village scale have been devised to render the cake edible to cattle by detoxicating it. By aqueous or expeller extraction at very low pressures the cake can be used for preparing adhesives. Investigations on oil cakes obtained from Argemonne Mexicana, Xanthium, Strumarium and Citrulus Vulgaris are being made in our laboratory.

Production, Sales and Standardization of Soap and Allied Industries :

Group A : Standardization in Soap Production on a Village Scale

Paper I

By Shri. V. R. Joshi

Supervisor-cum-Chemist, Bombay Village Industries Board, Bombay.

The Non-edible Oils and Soap Industry would attain success if our centres produce quality soaps which can stand competition in local village markets. The quality of the soaps can be standardized only when our centres are duty-conscious. The core of this Industry is the Seed Collection programme. It is essential that the collection of non-edible oilseeds available in various parts of the country is undertaken on an extensive scale by the centres located in the respective areas. Again, non-edible oils crushed in the ghanis established by the centres are to be used in the preparation of soaps produced by the centres. Looking back at the progress achieved by the centres in Bombay State, a sorry state of affairs can be seen. A number of centres have failed to co-operate with the Commission's programme.

In order to supply Non-edible oils to such centres which may not be in a position to collect sufficient non-edible oil-seeds due to their non-availability in the region, the Commission should directly undertake the establishment of oil crushing centres in suitable areas. In Bombay state such centres may be established at places shown below:-

No.	Seed	District	Approx. place
1	Neem	E. Khandesh	Umbarkheda
		Ahmednagar	Shevgaon
		Sholapur	Barshi
		Aurangabad	Vaijapur
2	Mohwa	W. Khandesh	Khandbara
		Panchamahals	Devgad Baria
3	Pisa	Ahmednagar	Bhandardara
		N. Satara	Mahabaleshwar
4	Karanaja	Kolhapur	Panhala
5	Undi	Ratnagiri	Malvan
6	Khakhan	Kaira	Nadiad

By such arrangements, a constant and regular supply of non-edible oils can be assured to all the centres and they would march a step forward in standardizing the quality of soaps. To achieve this end appointment of skilled labour and their active participation in the centres' management is no less significant. The vexed question of workers' participation in the management has been receiving attention since a long time. Establishment of Oil and Soap Industrial Co-operatives should also be encouraged to the greatest possible extent to bring about an atmosphere of confidence and a change in social climate within the Industry itself.

A systematic study of the soap market should be made by the Supervisors when they visit various places in order to find out the popular quality of soap. This would provide ample guidance in introducing newer brands of soap.

The Quality Control Committee appointed by the Khadi & Village Industries Commi-

ssion has to fix up some specifications for standard washing soaps. Members of the Committee may undertake frequent tours and give on-the-spot instructions to the production centres as regards the preparation of standard quality soaps with non-edible oils available at the places. The technical staff of the Industry should again be trained for a period of, say one month, to make themselves sure that they can produce standard soaps as per specifications with any variety of non-edible oils.

It is true that standard quality soaps are difficult to be produced at our centres with the non-edible oils such as Neem, unless the centres are in the know of efficient manufacturing techniques. The standard of the trained personnel coming out of the Khadi Commission's soap training centres needs to be toned up. In order to improve the position, the training period of the supervisors may be extended to at least 6 months. Under-graduates may be imparted only extensive practical knowledge in soap-making during the 4 months training period.

Paper II By Shri. V. P. NADKARNI

At first thought it seems that standardization in our industry is quite a distant object to be achieved, because our products are an outcome of hundreds of different centres. But when we begin to think about it, standardization can be easily brought about in our case, provided all the production centres work with one brain and also a sense of uniformity.

Standardization does not necessarily imply adoption of a particular minimum standard in quality and quantity in conformity with specifications. There should be a larger uniformity and oneness in our standardization. By this I mean, not only standardization of the quantity and quality but each and every aspect of our soap (or any other product). And, therefore, I make three categories in the standardisation of our village soap. They are :-

(1) Standardization of outer appearance.
(2) Standardization of quality and quantity of soap.
(3) Standardization in price structure.

By sticking to a standard and uniform outer appearance, we can know at once the area of circulation of our product.

A commodity gains tremendous popularity in the market only when it is seen by the prospective customers in large quantities and greater circulation. Customers prefer only that brand which is commonly popular. Now, as the circumstances stand, the non-edible oil soaps have as many different names as there are production centres and, therefore, it is difficult to aquaint them with large masses of customers. There is only one 'Tinopal' available in the market. If we have hundreds of companies producing this chemical, nobody would know all the brands and consequently there would be greater competition. This is what exactly happens in the case of our soap. We have a thousand brands at thousand different places. This is not conducive to efficient marketing.

Standardization or uniformity in outer appearance is not going to have any ill-effects on their different producers or their present market. The individuality can be retained to a certain extent and at the same time gain more market and popularity.

Quality and Quantity :

(1) This will give assurance to people about the quality and uniformity of weight throughout India.

(2) The next obvious effect is more popularity and hence more sales. The customer definitely goes for a better quality always.

(3) By bringing about this standardization we can prove that any non-edible oil can be effectively used in soap making and the best soap can be made.

(4) There would be a wider scope for going in for specifications and their selection.

(5) If more sales are achieved, free movement of the product can be brought about without hampering the market of other products.

(6) Work of propaganda could be simplified with better effect.

The burning question of our industry at present is the standardization of quality. Addressing the seminar of the field staff of the Industry at Rajur last year, Dr. J. G. Kane remarked that we should give up the idea that village soap is bound to be of bad quality due to the smaller scale of manufacture. He also advised that the sentimental basis in whatever work we may undertake should be abolished. The primary function of laundry soap is cleaning of cloth or other things and obviously the cleaning property should be regarded as No. 1 essential of any good soap. Prof. Kane had further stated that the fatty acid composition is the main factor which contributes towards cleaning property of soaps. We must now go a step forward and come to a conclusion about the quality of soaps. Prof. Kane in his discussion told us that any good soap must have these three oils viz.

(1) Nut Oil (Lauric acid)
(2) Hard Oil (Stearic-Palmitic acid)
(3) Soft Oil (Oleic acid).

Almost all non-edible oils are soft oils but we can get some hard oils too.

These oils can be put down as follows :

Mohwa	Soft	40.5	Oleic
Undi	Soft	48	Oleic
Rayana	Soft	57.5	Linoleic
Maroti	Soft	48.7	Hydnocarpic
Karanja	Soft	61.9	Oleic
Neem	Hard	61.9	Oleic
Pisa	Hard	90	Lauric
Khakhan	Hard	47.2	Lauric
Dhupa fat	Hard	39.9	Stearic
Kokum	Hard	52	Stearic

Khakhan oil has 25% Lauric acid, 25% Myristic acid and 25% Stearic-palmitic acids and, therefore, it gives a perfect soap with 100% Khakhan oil. We are already using a nut oil in a limited quantity. By choosing the above or any other non-edible oils in a proper manner each and every centre can be given a certain formula to which it must adhere. This specific formula for each centre can be decided on a State-wise basis, i. e. for each State the formula for a certain standard quality can be decided on the basis of availability of oilseeds in that State. The Quality Control Committee can do a great deal in this respect. In this way we can achieve about 90 per cent standardization at State level. Once this in achieved, the next few years will give us ample experience in achieving a standard quality in all our soaps.

Price Structure :

Though this aspect is not quite possible at this stage, efforts may lead us to have :

(1) More market in rural areas.
(2) Supremacy over all other brands.
(3) Uniformity in profits of all centres which means stability for the industry as a whole.

Standardization in price structure of soap is going to be a tough problem for our industry, because our soap centres are of

three different grades and not of the grade of one minimum economic unit. Also in the standardization of price, labour plays the main role. The availability of cheap labour, of course, should not arise in our case as the Industry aims at giving reasonable wages and more employment. Even then the value of labour is not the same in all parts of India. And, therefore, this aspect of standardization is out of question, at least for a few years within which time we must bring about the following favourable conditions throughout the country :

(1) Monopolising the non-edible oil seeds collection so as to be able to fix wages for seed collection in case of different ne-oil seeds.

(2) Standardization of wages at different levels of work at production centres.

(3) And last but not the least, the evolution of a standard " Economic Unit. " After this stage we can standardise the equipment of soap unit etc.

Group B: Sales of Soap

By Shri. H. G. MURALIDHAR, B. Sc.,
Chemist, Co-operative Cottage Industries, Tumkur.

The key to success for soap sales by our Centres is the way they are able to present the soaps in the market. The foremost consideration is whether the soap made is capable of being stored for a few months without sweating. Further, it is necessary to see by what process the soap has been prepared. Out of the three processes, namely the cold process, the semi-boiled process and the full boiled-process, the last one is relatively lengthy, costly at the same time gives a good soap from the view point of colour and keeping quality. The semi-boiled process is mostly in vogue in our centres as the full boiled process cannot be introduced on account of certain obvious limitations.

2. Besides the production process employed, combination of oils is no less important, especially for those using ne-oils. In order to remove colour and colouring matter in soap prepared by semi-boiled process, it is necessary to refine the oils. In case both refined and unrefined oils are to be used, the percentage of the latter should not be so great as to give bad odour and colour to the soap, thus making it unpopular among consumers. For Karanja and Neem oils salt and acid refinings followed by two methodical washings with salt water are enough for removing 60 per cent of impurities.

3. Our Centres have limited working capital and are expected to have a turnover of this at least thrice in a year. Production and sales should, therefore, be co-ordinated so that by too much production and consequent piling up of stocks the capital may not be blocked. In this context the two main handicaps of the Centres are (i) Soap production is undertaken many a times with the primary objective of achieving production targets rather than for maintaining quality of soaps; (ii) The Centres do not take proper steps to make their soaps known to the people. In short, they lack the spirit of a businessman.

4. The reasons likely to deter sales of soaps by our Centres have been summed up as follows :—

(i) Situation of the Soap Centre might have been such as to cause excessive expenditure for collection of seeds or for transportation of raw materials. Similarly, oil pressing Centre might not have been situated at a convenient place, thereby increasing the cost of production and price of soap.

(ii) There might have been some inherent defects in the working of the Centre-for example in collecting, drying, dehusking and depulping processes of seeds might not have been undertaken with proper planning and care, so as to yield less and bad quality of oil. Or, the furnace, other constructions as well as other processes might have involved the Centre in unnecessary expenditure, on account of negligence or ignorance on the part of the Chemist-in-charge.

(iii) The attitude necessary for furthering sales might be lacking.

Soap Production, Sales, local demand.

By Shri. Desh Mitra Vasudev,

Punjab Khadi Gramodyoga Sangh's Soap Centre, Dist. Baijanath, Kangra (Punjab)

As you all know our centres have been started on a subsidised basis. As a result of the present working of the centres, most of them are unable to adjust their production programme according to the local demand. Situated as they are, these village industries units are put to considerable inconvenience in transporting raw materials and finished products. However, this obstacle can be removed easily. The main consideration of the centres should be local sales.

Our products are put to a disadvantage in competition with the cheap soaps of low quality filled with soda silicate. The villagers who cannot differentiate between good and bad quality of soaps naturally prefer the lower priced soaps. It is, therefore, very essential to convince the villagers of the superiority of our soaps, at the same time creating a psychological effect on their mind, that by the gramodyoga soap their brethren in the villages are lifted from the throes of unemployment. Sometimes it is observed that, though the villagers ask for our soaps, the shop-keeper who is not in favour of our soaps, induces them to buy other soaps. Not seldom these people are cheated on account of their illiteracy, since they are not in a position to make out from the wrapper which is the soap they want. Wrappers with some sort of differentiating mark, for example, that of a sun, a peacock etc. will help the illiterate to recognize our soaps easily.

Our centres are not in a position to spend large amounts for advertising their products. It would facilitate greatly, if the Commission finds out some way to remove this difficulty. The Bhandars run by the Khadi & Village Industries Commission do not pay as much attention for sales of soap as they do for other products, especially for Khadi. Therefore, necessary arrangements should be made so that sales of soaps are properly organised.

Group C: BY-INDUSTRIES FOR OUR SOAP CENTRES

By Shri. Bindubhai M. Desai,
Kora Gramodyoga Kendra, Shimpavli, P. O. Borivali,

The Non-edible oils which are being used for Soap making are all " fatty oils ". Chemically, the fatty oils are Glycerides of fatty acids. When these fatty oils are mixed with an alkali (caustic soda or Potash), and boiled, chemical reaction sets in, resulting in the formation of Sodium or Potassium Soap and the liberation of Glycerol. Thus the Glycerol which is liberated is a by-product of soap.

Separation of Glycerol from the soap is effected by a process known as " Salting out or graining ". Common Salt is added to the boiling aqueous solution of soap; the soap separates out above, leaving the acqueous glycerol solution known as " Spent lye " below. This is allowed to settle overnight; next day the lye which contains most of the Glycerol contained in the oils (about 10% of the oil) is removed from below to an iron tank and treated for the recovery of Crude Glycerol.

Recovery of Crude Glycerol :—

The lye from the soap pan is transferred to an iron tank known as " treatment tank " and allowed to settle. As the lye goes on cooling, dissolved soap separates out and comes up on the surface and is removed. After complete cooling and removal of separated soap the lye is neutralised by hydrochloric acid; Ferric Chloride or aluminium sulphate is then added to precipitated iron or aluminium. Soap acts as an efficient coagulant or absorbent for other neutral organic materials which may be present and thus effect fairly thorough clarification. The clarified lye is filter-pressed to remove the precipitated iron or aluminium soap and after neutralizing the acidity of the lye by sodium hydroxide, it is taken to a vacuum evaporator. In the evaporator the lye is concentrated by steam heating; as the lye becomes concentrated, salt begins to separate out and is removed. This salt can again be used for graining soap.

The lye in the evaporator is concentrated until it has a specific gravity of 1.23 to 1.3 or 30-32° Be. At this stage when it contains about 80% Crude Glycerine and 8-10% salt, it is taken out from the evaporator.

The quality and valuation of Crude Glycerol depends on whether or not it conforms to the standards laid down by American Oil Chemists' Society. As far as I can gather, the Indian Government have not yet drawn up their standards for crude as well as distilled Glycerol.

The crude Glycerol is further purified by subjecting the same to vacuum Distillation under controlled conditions in a specially constructed iron still. The distilled Glycerol thus obtained is pure Glycerol and is known as ' Dynamite Glycerol '. This contains up to 2% water. For obtaining what is known as ' chemically pure Glycerol ', this once distilled Glycerol is again distilled. The Dynamite Glycerol is extensively used for the manufacture of Nitro-Glycerine. The Chemically pure Glycerol is largely used in Pharmaceutical and toilet industries.

What I have described above viz. Recovery of Crude Glycerol soap from Lye and then refining the same to chemically pure Glycerol is actually being carried out in large soap factories of Lever Bros., Tatas, Godrej and Swastik Oil Mills. Glycerol is a very valuable by-product of soap. It not only reduces the cost of soap but is in itself a valuable chemical for other industries. I may tell you that during the

second World War, the price of Glycerol had gone up so much that it became the main product of Soap Industry.

The question naturally arises whether it is possible to take advantage of this by-product in our Soap centres. I may state that the by-product can be recovered, as shown above, only if the soap is prepared by the full boiled process. As far as I know, very few centres, if at all any, are producing their soap by the full boiled process. Most of the centres including the Kora Gramodyog Kendra are using combined process (grained process for bad oils and semi-boiled process for finishing the soap) for their soaps. We have, however, recently made two tanks for preparing soap by full-boiled process. Construction of these is awaited and will be finished within a month or two. When we start producing our soap by full boiled process, we have a programme to utilise the soap-lye for recovering ' Crude Glycerine. ' The whole scheme is yet in a very experimental state. If, as a result of our endeavours, we are able to recover ' Crude Glycerine ', conforming to the standards, it will be a great step forward.

Research and Development in Non-edible oils and Soap Industry

By Dr. R. K. Shrivastava
and Dr. M. Sadashiva Rao
J. B. Central Research Institute for Village Industries, Wardha.

It is proposed in this paper to discuss broadly the main problems of research and development of the cottage soap industry based on non-edible or minor oil resources. The principles of soap making are simple and fat and soap technology is a well developed subject at present. The question may well be asked what is research in the field of the cottage industry other than adopting or adapting the methods and equipment of the large scale industry. It is true that the subject of soap manufacture and in particular the methods of purification of oils, the physical chemistry of saponification, the unit-processes and unit-operation involved and methods of analysis for process and quality control are all developed to a point that can be readily translated to the cottage sector. However, the main problems of research in the cottage sector of the industry, as being developed under the Khadi and Village Industries Commission, are not the same for which research and development in the large-scale soap industry already provides solution. The problems are in the broader field of organisation, for attaining the objectives of economic stability or viability and for the ultimate purpose of minimising competition from the larger sector and maximising employment in the cottage sector. In order to understand what the problems are we must review briefly the main points of structure and economy of the large-scale soap industry in this country which is the chief competitor and follow appropriate strategies to attain our objectives.

The large-scale or organised soap industry, as it exists in this country to-day, is a highly competitive industry depending entirely on marginal returns. It produces on a large scale for securing large scale economy by taking advantage of indivisibilities, firstly, of technological processes and secondly, of economic factors of production. The problems of this industry in the technical field are relatively minor problems but its problems in the field of economy and organisation are major problems. Vegetable oils which form the main raw materials are edible oils and in short supply in the country both for industrial and food purposes. The prices of oils are high and fluctuate widely. Therefore, the manufacturers strive to obtain a control on the oilseed and vegetable oils market. Tallow which is one of the most important raw materials in other countries is not made use of in order to preserve the sentiment of the consumer for eschewing animal fat, though large untapped sources of tallow are available from fallen animals in this country. Grease, or inferior grades of animal and vegetable fats extracted from food and animal refuse, is also not utilised. The formulations are standard or established formulations using a good percentage of coconut oil or palm oil to supply lauric acid fats. Both

the above oils are imported into the country for soap manufacture. Caustic soda is another raw material which is in short supply. The problem of its supply has been solved by different manufacturers in different ways. The largest manufacturer in the country has foreign subsidiaries and can command sufficient supplies from outside the country. The largest Indian manufacturer has a subsidiary caustic soda and chlorine industry. Another large company has solved the problem by a fat splitting process in which the more easily available soda ash can be used. A fourth company has attempted to use a Sharples continuous process in order to achieve plant economy. They have also problems in marketing. Both washing soaps and toilet soaps are produced and extensively advertised to boost the demand. The washing soap market is vast and less competitive than the toilet soap market. On the other hand, the toilet soap market is highly competitive. Apart from the need of plodding the neat soap, the cost of perfumes is an important factor in post-war years. There is also another cost factor which limits the return on the large-scale soap industries. This is the freight cost structure, since the soap is mainly manufactured at one end of the country (Bombay) and has to be distributed to the furthest corners of the country. One company has recently established factories in Calcutta and Madras to reduce freight costs.

On the face of the above situation of the large scale soap industry, the policy with reference to the cottage industry has the following strategies :

(1) To make soap only from non-edible or minor oil resources which have yet to be developed fully.

(2) To concentrate, as far as possible, on washing soap which can be satisfactorily produced on a cottage scale by a semi-boiled process with simple equipment.

In order to develop these strategies fully a great deal of investigation is required. We shall point out the problems requiring high priority and indicate how they can be solved.

Non-edible oil and oilseeds resources :

The non-edible oilseed resources are considerable in the country. The following minor oilseeds among others have attracted attention.

Mohwa (Bassia latifolia); Neem (Azadirachta Indica); Karanja (Pongamia glabra); Pisa (Actinodaphne hookeri); Kokum (Garcinia India) Khakan (Salvadora Oleioides); Undi, punna (Calophyllum Inophyllum).

In all these oilseeds, collection problems are mainly organisational problems. The processing of oilseeds and oils are problems requiring considerable investigation both in the laboratory and at an operational level.

Storage and Processing of oilseed :

The first question is how long should the seed be stored for the oil to mature? Such information is available in the case of cultivated oilseeds but not for forest oilseeds. The second question is how should the oilseeds be processed to effect an economic recovery of oils. There does not exist well-developed equipment to process the several types of minor oilseeds in the country.

Neem seed :

Taking Neem seed (or Neem fruit) the seeds are collected during April or June in the rains and are sun-dried and stored till October or December or even later when they are decorticated and the kernels removed to process the oil in the ghani. The difficulties of collection, storage and processing have been explained by the Indian Central Oilseeds Committee as follows (Report I. C. O. C. Dec. 1950). According to the Committee, "the main difficulties at present in harnessing of such a plentiful

resource of oil are (i) the harvest of the neem fruits is obtained within a very short time in the beginning of the rainy reason, (ii) the seed obtained contains a lot of moisture and deteriorates quickly during storage, (iii) the oil possesses an unpleasant odour. The seed while in storage often gets so much charred on account of the heat produced by auto-oxidation during storage that no oil can be produced out of it. In order to encourage the neem oilseed crushing industry the following investigations are necessary : (i) to find out proper method of treatment of neem fruit to produce good dry neem seeds which can be stored throughout the year; (ii) to work out best method of crushing the seeds and (iii) to treat the neem oil produced to remove the unpleasant odour."

During the succeeding period of seven years the fatty acids content and the nature of the odoriferous substance in the neem oil have been thoroughly investigated. The bitter principles and some of the sulphur containing odorescent components can be separated by repeated extractions of the oil at ordinary temperature by means of ethyl alcohol or commercial methyl alcohol. Unfortunately this method does not appear to be practicable for cottage scale deodorization of the neem oil and hence the oil has to be used as such or salted out neem soap has to be admixed with other oils and finally processed by semi-boiled method.

A preliminary study of the effect of conditions on storage has been undertaken in the Central Research Institute for Village Industries, Wardha, and it has been confirmed that for the same period of storage, seeds with high moisture content at the time of storage give out oil with high acid value as compared to oilseeds with low moisture content. The oil content of the stored seed matures in a period of about 12 weeks. It is obvious that as in neem seeds, the problems of drying the seeds and storage assume great importance for systematic production of good quality oil. We should like to know how far cow-dung gas (methane) plant can be utilised for artificial drying in the village by an individual or a society. The depulping of the fresh neem seeds in a depulper, as developed in this Institute is a promising method for enabling storage under dry conditions. But it has not yet given fully satisfactory results due to loss through breakage of the kernels. However, experiments on developing a better depulper are being continued as there is a great scope for this method if properly developed. The more usual method at present of obtaining neem kernels from the neem seed is to decorticate in the saw-tooth neem seed decorticator (developed at the Institute) and separate the kernels obtained by sieving, winnowing and sifting. A Wardha Ghani can press out 34% oil from a good quality neem kernel. The cake, however, contains 18% residual oil on dry basis which is very much more than that left, for example, in sesame cake. The problem of increasing the recovery of oil from neem kernels by Wardha ghani thus needs investigation.

Pisa seeds :

This seed offers one of the most important oils that, if the resources are properly developed, can replace coconut oil in cottage soap industry. The seed consists of 13% of outer shell that contains 25% yellow liquid fat. The whole seed contains 67% pale yellow hard fat. Problems of storage have yet to be investigated. On crushing the whole seed in a Wardha ghani with the proper amount of water, it was observed that no cake was formed, which is an essential condition for extraction of oil in the ghani. Groundnut cake, to the extent of 3 lbs. for 16 lbs. of pisa seeds, was then added and pressing continued with the requisite amount of boiling hot water. About 54% of oil on weight of seed could be obtained,

However, as the oil is solid at room temperature, artificial heating had to be resorted to, to get the oil out. It is suggested that crushing of the seeds be carried out on ghanis in summer to minimise artificial heating expenses.

Mohwa :

Although this oil has attained commercial importance and is being used by both large and small scale industries, the decortication of the seed to obtain the kernel is still carried out by hand. As yet no implement or machine has been perfected that can be introduced in villages. Introduction of such a machine will improve the quality of the kernel and the time saved in decortication can be further utilised for collection of the seeds. Experiments are under way for developing a hand machine for this purpose. Another important problem is the drying of the seeds. As the season for collection of the seeds nearly coincides with the approaching rainy season, incomplete dried seeds are liable to fungus attack resulting in inferior oil content. A thorough investigation into the tolerable moisture content and a probe into the behaviour of the seeds in storage with special reference to the oil content is very important.

Purification of oils :

Purification of oils is important since the simplest method of saponification in the small industry is the semi-boiled process and does not permit purification through settling. This difficulty has already been stated in the case of neem oil. An important defect of our lack of fully developed cottage method or purifying neem oil is that we cannot use it to the extent required in washing soap which is our main production. It is important to realise that non-edible oils which have not been hitherto used regularly in soap manufacture may contain unknown impurities, which by oxidation etc., may reduce the shelf-life of the soap. Methods of purification must also be such that they can be easily carried out in the cottage industry with its a relatively simple capital-sparing equipment.

Soap Boiling :

The soap boiling process for neat or settled soap is the standard method of the large industry. The method has been utilised in several of the cottage soap centres. However, the question whether the large scale economy available in the operation of the large soap kettle and the advantage of recovery of soda, salt and glycerol can also be availed of on cottage scale is a subject worth investigation. A project is on hand at the Institute to develop efficient and economic methods for saponification. We have experimented with a method for preparing anhydrous soap using soda ash instead of caustic soda. The experiments confirmed the necessity of purifying the oils thoroughly but did not give satisfactory conclusion, regarding general feasibility of the process on cottage scale. Fuel economy is important in the cottage industry and the possibility of using methane gas, a large amount of which can be generated by fermenting the pulp of the neem fruit must be fully investigated, as it would make a remarkable improvement in economy.

Soap Formulations :

The subject of soap formulations is at present largely an empirical subject. Successful soap formulae in the west are based on coconut and palm oils and tallows. How empirical the subject is may be illustrated by the fact that during the Second World War western soap makers had to find substitutes and the quality of the soap declined greatly. In developing soap formulae with non-edible oils considerable amount of purely empirical investigations are necessary. These investigations are time-consuming since there are no standard techniques such as accelerated shelf-life tests and subjective tests for soap by which you can

evaluate market acceptance. Since the types of non-edible oil resources vary widely in different zones of the country, it is not possible to have uniform formulae. A large number of proved formulae with different blends of oils are necessary. Experiments through commercial production, which is apparently the easiest method, is also the most risky. It may easily spoil the market and bring a bad name to the cottage soap industry. Therefore, there is a need for rapid investigation and quick dissemination of the results to guide the cottage soap centres. The Research Institute has launched on a series of investigations on the subject of formulations for all the important non-edible oils available in the country. It is trying to develop tentative tests which can be relied upon to judge good soap. The problems of formulae are more acute for toilet soap than washing soap. It will be helpful if the use of tallow is more generally adopted. The supply of tallow must be from the flaying centres established under the Commission. Tallow assists in giving hardness to the soap and fixing perfumes and will be particularly of great help in promoting both washing and toilet soap market.

Caustic Soda : The supply and costs of caustic soda for the cottage soap industry are highly fluctuating. The development of the caustic soda and chlorine industry, expected to be achieved in the second Five Year Plan, is the only feasible solution.

General Economy :

Cottage soap industry is subject to several factors most of which are economic factors and only a few of which fall into the province of technology. In order to get an overall picture of how these factors should be increased or decreased through appropriate action to promote the industry as a whole, it is necessary to use certain techniques of econometrics on the field data so far available from experience of organising centres and running them. A project has been undertaken at the Institute with data to be supplied by the soap Organiser. This is to work out a " Production-function " which can quantitatively show the relations of wage return or profit to capital investment, fluid assets, market prices, tools and techniques, employment, etc. etc. It is hoped to complete this work in the current year. The Production function can show in which direction the improvement of the industry should receive high priority. It is a line of investigation which is essential for economic survival of a small industry which is subject to great influence by varying economic factors as well as for determining in which direction the tools and techniques have to be developed to minimise competition and maximise employment.

Co-ordination between Non-edible Oils and Soap Industry and other Village Industries

Paper I

By GANGADHAR NAYAK, B.Sc.

Commenting on the role of Village Industries in the Indian Economy, Vinobaji said "I never say 'Sita' 'Sita' or 'Ram' 'Ram' separately. I wish them together as "Sitaram," Sitaram" where the Sita stands for agriculture and Ram for village industries. However, we do not propose to discuss here, how agriculture and village industries could be co-ordinated. Our attempt is to see how best these village industries could co-ordinate between themselves.

Our Industry is often called as NEO industry, meaning thereby a New Industry. Truly, it is a new industry in the list of village industries. It is needless to say that a new industry like ours, in its stage of infancy, would require assistance from all sides and of all types, may be in matters of finance, organisation, production, marketing, propaganda, research or any other. In our discussions, however, we will confine ourselves to few of the important points and study them in the light of some village industries.

Non-Edible Oil Industry and Village Oil Industry—same goal, different approaches :

Village oil industry and non-edible oils industry, perhaps, have the same objectives before them, viz. making available enough quantity of edible oils and fats of good quality to our countrymen for consumption purposes and at the same time provide employment to maximum number of persons while doing so. Approaches may be a little different. If village oil industry aims at achieving its objectives by crushing more and more edible oils in ghanis and supply it to people, the non-edible oils industry hopes that these would help replacing edible oils in industrial field and make available an equal quantity of edible oil for human consumption. So, any attempt to develop one of these industries would certainly mean the development of the other also, of course indirectly, so far as they take us nearer to our objective.

Both of these industries have bullock-driven ghani as their device to produce oil. So it is clear that 'improved and still improved ghani' is a matter of concern of both. The same thing applies for manufacture of ghanis also. It is said that a large number of ghanis in our country lie idle or do not get enough work throughout the year. These ghanis would not offer us good returns unless they are kept engaged for certain minimum number of days.

It is well-known that seed collection season of non-edible oilseeds lasts for a certain small period, during which seed requirement of the whole year has to be collected and stored. These seeds will have to be processed and crushed within a particular period to get maximum yield. Though seed collection season for each type of seed falls at different times of the year, still, non-availability of various types at a place, makes non-edible oils crusher keep his ghanis idle for some time, in many cases. This calls for a well-defined plan for the rotation of oil pressing, The importance of

such a plan is also to be seen in point No. 2 of the 'Five Point Programme' enunciated by our industry Organiser, recently. According to me, solution is not far to seek. And it lies in the co-ordination of activities of these two sisterlike village industries.

Village oil industry could well take up the non-edible oil seed crushing in its off season. For example, the ghanis of village oil-men are said to lie idle in rainy season. Now this is the season for crushing Mohwa and Karanja seeds in Non-edible oil Industry. Oil-men could well help to crush these seeds for the near–about non-edible oil seed crushing centres. As the time factor affects the yield of oil by these ne-oils considerably, the assistance received by these oil-men could be greatly appreciated.

In turn, non-edible oil crusher would press edible oils whenever he failed to collect enough stock of ne-oil seeds for a particular season. Name of Castor seed, a non-edible oil seed is worth a mention here as it is readily available in market and could always help in keeping one's ghanis occupied.

Though a definite programme giving the list of edible and non-edible oil seeds, cannot be chalked out, since seeds available and local conditions vary from place to place, the programme as a whole is worth a trial. This type of plan drawn mutually, if practised properly, I have no doubt, would lead to increased production of edible oils so far as village oil industry is concerned and would help storing adequate quantity of neoils as well as to give better yield in case of non-edible oils industry.

However, there is a point of caution here. Though, a distinct line between the proposed activities of these two industries cannot be drawn for obvious reasons, it must be remembered that everything within limits and done after proper planning would lead to nothing but good.

Without going into further details, I would just like to point out that research work on storing seeds, oil-crushing preservation of oils, disposal of cakes etc. being the common points of interest, if worked out on the basis of co-ordination could benefit both.

'Give and Take' our policy with Village Leather Industry :

Uses of non-edible oils like Karanja oil and castor oil in 'vegetable tanning' are well known. After the hides are tanned, some oil is supplied on both the surfaces of the tanned leather to give it the desired softness. Otherwise, the leather will be hard after drying. Besides, application of oil prevents oxidation of surface tannins. Thus, these oils have an important role to play in leather industry.

It is said, though in some parts of Southern India Karanja oil is used for vegetable tanning, in other parts of our country, ground-nut and linseed oils are mainly used for the purpose. The place of leather industry in the village economy as well as in the economy of our country as a whole is well recognized. The annual production of hides in our country is said to be of the order of twenty millions. Figures for 1954 show, that all the organised factories put together tanned about two million hides and Chinese chrome tanners at Calcutta tanned about $1\frac{1}{2}$ million hides, the rest being tanned by cottage workers. This means more than 80% of the hides available in our country are tanned on cottage or village scale. Since tanning on cottage or village level is mainly vegetable tanning of hide, ready demand for about one lakh Bengali maunds of Karanja oil could be well realised.

Castor oil is one more non-edible oil used for various purposes in vegetable as well as mineral tanning. The use of castor oil in the preparation of fat liquor,

which in turn contains sulphonated castor oil, is not new to us. Feeding the leather with some emulsion of oil in water is the idea behind the process. Whether an oil be edible or non-edible, for a tanner it is enough if he gets one of the above oils which impart desired properties to his leather at quite a cheaper cost. Hence, any effort to introduce Karanja oil or any suitable non-edible oil in vegetable tanning would go a long way in creating a ready market for our excess non-edible oils.

Our relation with the Leather Industry does not stop here. Many of us are aware of the fact that a product called 'tallow' could be recovered from dead animals. By this I do not mean that all animals necessarily give tallow. It depends upon the condition of the animal at the time of its death. Average quantity of tallow that could be recovered from one animal is said to be about 5 to 20 lbs. At present recovery of tallow is not much in practice.

We know that refined tallow could give us soap of good quality. Hence recovery of tallow of millions of animals, which at present is going waste, could serve as a best raw material for our soap industry. Without entering into much technicalities involved in the recovery of tallow, as I am no authority on the subject, I have just hinted the possibility. Further, though, strictly I am not an advocate of 'barter system' this sort of co-ordination between non-edible oils and soap Industry, and village leather Industry by way of 'give and take' would enhance the activities of both.

'Gur and Khandsari industry'–Creation of new market for ghani pressed castor-oil :

The production of sugarcane has increased considerably in recent years. The total area under sugarcane cultivation at present is said to be over 4 million acres and production of sugarcane in about 6 million tons in terms of gur. Nearly 80% of the sugarcane produced is crushed for manufacture of sugar, gur and Khandsari, the remaining being used for chewing, planting etc. The manufacture of 'Gur' is an important cottage industry responsible for the utilisation of 60% of the total cane crop and for employing more than 70,000 persons. Annual production of gur is near about 4 million tons, depending upon the availability of cane and price of gur during the particular year.

If one observes a gur making process, he would note that after heating the cane juice for a couple of hours when foaming and overflowing starts the panman will carefully add a little quantity of castor oil and one would be surprised to see how everything subsides. What I wanted to point out here is not the process as such but the utility of a little castor oil. When one of our production centres reported to me that a Gur-making concern nearby bought castor oil worth, Rs. 4000 during this season, for the purpose not well known to them I was but amazed. When I went to the actual spot and studied the process, I could learn about the exact utility of this commodity. 164 gallons of cane juice to give about 4 to 5 B. Mds. of Gur had used up about 4 to 5 tolas of castor oil. That is, production of one maund of gur had corresponded to the use of about a tola of castor oil. Such a small quantity it is, but when thought in terms production of 3 to 4 million tons of gur, would definitely mean a considerable figure. As I have already pointed out 'Gur making' is more a cottage industry, as such it should not be very difficult for us to cater to the needs of nearby gur makers in supplying the required quantity of castor oil.

Turkey red oil in dyeing Khadi :

Castor oil is the basic raw material used in preparation of 'Turkey red oil'. Turkey red oil is used in dyeing cloth in textile industry. So quite a good quantity of castor oil can find its way in the preparation of Turkey

red oil used in dyeing Khadi cloth. Our industry's co-ordination with Handloom industry, too, is desirable in this matter.

Co-ordination at all levels :

Co-ordination, which we aim at, should be at all levels. We know that, for some technical reasons, all small industries find it difficult to stand in the market and compete with well organised large scale industries. This is a common problem. Proper co-ordination, in matters of marketing, between various village industries would undoubtedly result into mutual promotion.

It is not just enough one's telling others to use Khadi cloth or ne-oil soap. One could best induce this idea only after taking upto the use of other's produce for himself. Self-demonstration is the best demonstration. Our policy in this regard should be " Live and Let Live. "

With a little of co-ordination in our activities and with co-operation, an important problem like that of marketing could be easily overcome.

As an example,the present Khadi production is said to be of the order of 30 million yards, annually. At the present rate of per capita consumption of cloth and soap, if all the Khadi wearers use ne-oil soap only for washing purposes, there would be an immediate demand for 20,00,000 lbs. of ne-oil soap. The figure would be still higher if all persons, near about 20 to 25 lakhs, engaged in production of khadi and other village industries articles are to go for ne-oil soap only.

What seems to be lacking is a little bit of co-ordination. Co-ordination should be accompanied by co-operation also. To achieve this ably, one should be selfless and be above all types of politics, personal and party.

Coordinated efforts should be made to educate the masses. They should be made to feel how best these activities could help them, and also to the nation as a whole. You might have heard of an Englishman who went to buy a certain article, saw it in all makes by different countries and appreciated each. At last bought one, produced by his own country and asked to comment on his choice, replied : " What is U. K. is O. K. That's all, Thank you, Sir. " This type of mentality and attitude towards one's own nation has yet to be generated.

Conclusion :

In the foregoing pages, without going into details and organisational technicalities, I have tried to give few of the many points where co-ordination between non-edible oils and soap industry and other village industries is possible. Co-ordination with co-operation, in practice could serve as the best cement to unite and shape the energies and efforts of all our workers engaged in the village movement. This calls for one more type of co-ordination, not described before. In the words of our Organiser, Shri. P. V. Subba Rao, it is : " Co-ordination at the lowest level ", by which he means ' Co-ordination between our mind and actions, ', between what we say and what do

Co-ordination between the Non-edible oils and Soap Industry and Village Oil Industry

Paper II

By Shri. P. G. CHOUDHARI

Supervisor-cum-Chemist, Bombay Village Industries Board, Poona

The non-edible oils and soap industry is not so much allied to other village industries as it is to village oil industry. From experience I am able to say that there should be no differentiation between ghanis crushing edible oils and ghanis crushing non-edible oils, as it involves financial loss, crushing of oilseeds being seasonal in nature the oilmen, bullocks and ghanis remain idle for a major part of the year. To solve this problem, for example the ne-oil soap centre at Shevgaon (Dist. Ahmednagar, Bombay state) gets neem seed collected and crushed in local ghanis by local teli families. These about four to five in number resume their usu work for the period other than the Nee crushing season. By devising such a meth there will not be any duplication in inve ment on ghanis, (for edible oilseed crushi and non-edible oilseed crushing) at the sa time this amount saved can be utilised in better way for furthering of sales etc. Th co-ordination between the two industr should be only in respect of oil crushir the other processes viz. collection of c seeds, soap making etc. should be undertak by the soap production centres themselv

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133. Shri. C. B. Patel,
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135. Shri. P. C. Ojha,
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136. Shri. S. N. Chaube,
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137. Shri. V. Laxmikanthan,
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138. Shri. A. L. V. Prasada Rao,
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139. Shri. Y. P. Rao,
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141. Shri. V. P. Nadkarni,
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142. Shri. Pattabhai Sitaram,
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143. Shri. Jagat Singh Rawat,
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145. Shri. S. D. Sulakhe,
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146. Shri. C. S. Jayaraman,
147. Shri. Jilal,
148. Shri. V. P. Patil,
149. Shri. Kedarnath Sharma,
150. Shri. Mayekar,

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151. Shri. J. C. Rai, (Hindi)
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All India Non-edible Oil Industry Association

153. Dr. P. S. Deshmukh,
President.
154. Shri. S. G. Shende,
Secretary.
155. Shri. B. V. Sule,
156. H. V. Mutalik,
157. G. M. Hake,
158. Shri. S. D. Khadilkar,
159. Shri. G. K. Joglekar,

ERRATA

Page	Column	Para	Line	
5.	—	3	5	Read " could " as " would "
11.	—	2	5	Delete " everyday " after " into sea "
14.	—	1	12	Read " C-tain " as " certain ".
25.	—	3	3	„ " he helped " as " be helped ".
39.	—	4	3	„ " Processesses " as " Processes ".
41.	—	1	3	„ " inceasing " as " increasing ".
43.	—	—	5 of title	Add " seed " after " oil ".
44.	2	4	title	Add " seed " after " oil "
44.	2	1	6	Read " accelarated " as " accelerated ".
48.	1	2	11	„ " outside " as " Outside ".
48.	2	—	20	„ " otherj obs " as " other jobs ".
48.	1	1	16	„ " light in the " as " light on the "
49.	1	2	1	„ " jatvoha " as " Jatropha ".
50.	2	5	4	„ " siightly " as " slightly ".
50.	2	6	4	„ " (wizls)" as " (Wij's).
51	2	1	2	„ " 90%". as 9·0%
51.	2	1	10	„ " Rauric " as " Lauric ".
51.	2	4	3	„ " abour " as "about"
52.	1	3	7	„ " int he " as " in the ".
52.	2	4	3	„ " the oil has lost " as " the oil loses".
55.	2	3	10	Delete " in " after " darker in ".
57.	1	1	1	Read " distribuing " as " distributing".
57.	1	1	2	„ " village " as "villages roundabout"
57.	1	3	9	„ " charrges " as "charges".
58.	2	1	2	„ " strictly " as " suitably'.'
58.	2	3	1	„ " decortieation" as " decortication ".
59.	2	—	5 of title	„ " Soap Industry & Khadi". as "Soap Industry, Khadi &"
62.	1		last line	„ "type" as "type"
64.	2	1	29	„ "negible" as "negligible".
64.	2	1	last but one line	Delete "be" after "to be".